An Address
ON
RECENT ADVANCES IN THE DIAGNOSIS, PROGNOSIS, AND TREATMENT OF HEART DISEASE: THE POLYGRAPH.

GIVEN AT THE OPENING MEETING OF THE SESSION OF THE TORONTO ACADEMY OF MEDICINE.

BY

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MR. PRESIDENT AND GENTLEMEN,—Will you allow me, in the first place, to thank you most warmly for the privilege of addressing you this evening on a subject at which I have been working, in association with Dr. James Mackenzie, for the last few years, and which, in my view, is of the greatest practical importance to the clinician?

Complaint is sometimes made of the slowness of the advance of knowledge which is being made in medicine, and it is sometimes asserted that in recent years, taken as a whole, the advance of medicine has not kept pace with that of surgery. While not fully accepting this view, it must be admitted that there is something to be said in its favour. And, if it be true, it seems to me that the cause lies in the fact that the physician, instead of adopting the methods of exact analysis, is too often satisfied with the most general inquiries and observations in his investigations of the many problems which confront him. In my opinion, what is lacking is an endeavour to bring practical medicine more nearly to the higher state of cultivation which has been reached by experimental science. Perhaps this is more particularly true in regard to the realm of therapeutics. Let me give you a small example of this. It has been believed for generations, both among experimental pharmacologists and practical therapeutists, that the internal administration of aconite directly diminishes the pulse-rate. You will find this belief expressed in the textbooks; but, if you search for real evidence upon which the belief rests, you will be disappointed. A year or two ago I conducted an investigation in regard to this matter. The cases chosen were 3 cases of mitral disease, 1 case of aortic and mitral disease, 1 case of malignant endocarditis with a high temperature, 4 cases of pulmonary tuberculosis, and 7 cases of scarlet fever. All the patients were kept in bed. The pulse was counted nine times a day, at exactly the same times each day, for some days before the administration of the drug, for some days during its administration, and for some days after its administration. First of all, samples of tincture of aconite obtained from several firms of chemists were employed. On being tested at the University College Pharmacological Laboratory each of these samples was found to be quite inert. Afterwards specimens of aconitina prepared in the laboratory were used, commencing with very small and gradually increasing to full doses. On comparing the records of the times when the patients were taking the drug with those when they were not taking it, in no case was there any reduction in the pulse-rate.

Now if it be true that the scientific method of investigation has not been sufficiently adopted in medicine as a whole, it is refreshing to turn to a branch of medicine in which its adoption has been rewarded with results which are nothing short of brilliant, and of tremendous practical importance. The work which has been done in recent years in the domain of heart disease has gone far to solve many of the most fundamental problems which have perplexed clinicians for generations. I venture to put forward the opinion that in few, if any, of the branches of medicine or surgery has there been in recent years a greater advance than has taken place in the realm of knowledge of cardiac disorders. This progress is essentially of such a practical nature and of such great value in regard to the diagnosis, prognosis, and treatment of heart affections, that it is the duty of every practitioner to be acquainted with its nature and scope, and this evening I want to lay before you some of the main points in the advance, dealing with the subject only from a practical point of view, with the hope that what I have to say will be of use to you in your daily practice.

Let me first of all try and show you how great was the need for new light on this subject. I think I cannot do better than touch upon two problems which have notoriously been sources of difficulty and perplexity to the clinician. The first is the question of cardiac irregularity in patients who may or may not exhibit evidences of valvular disease; the second is the extraordinary difference in the results of the administration of digitalis and its allies in persons who are suffering from identically the same lesions, and complaining of precisely the same symptoms.

Let us take the first question—namely, that of cardiac irregularity. A common experience of the practitioner is this: A patient comes to him complaining of some symptom or other, and in the process of physical examination he finds that there is a very definite irregularity of the pulse. There may or may not be evidences of valvular disease. What significance is he to attach to this irregularity? He is probably aware that cardiac irregularity may signify serious impairment or disease of the heart on the one hand, or, on the other hand, it may be of little or no importance. Indeed, on the one hand, it may be the only sign detected by the ordinary methods of examining the heart in cases in which there is serious involvement of the cardiac mechanism, while, on the other hand, certain irregularities are quite compatible with healthy hearts.

Now the second question—that of digitalis. As long as the drug has been in use for cardiac affections it has been known that the results of its administration are astonishingly various. Suppose you take three patients with precisely the same degree of cardiac failure and exactly identical lesions, and employ the same dosage of digitalis in each case. In one, perhaps, the results are extraordinarily good, the drug seems to act like a charm; in the second the results, though beneficial, are only moderate or slight; while in the third absolutely no good result at all can be detected. What is the cause of this variability? Is the drug capricious in its action or uncertain in its strength? It has been thought so. Or is it due to some particular preparation being active while another preparation is inert? This has been thought by some; and for this reason special preparations have been prepared and advertised as being more uniformly certain in their action. I hope to show you this evening that both opinions are wrong. My object is to try and answer these two questions, to try and clear up these two difficulties. And it is of vital importance to you in your general practice that these two problems should be solved.

Now, the enormous advance within recent years in our knowledge of cardiac disorders has been almost entirely due to the introduction of what are called graphic methods in examining the mechanism of the heart. For by these methods we can analyse the heart's action in a way which was never possible before. By means of an instrument called the clinical polygraph we can take a simultaneous tracing on the same recording surface of the radial artery on the one hand and of the jugular vein on the other. You can readily understand what an advance this is on the older method of merely taking a tracing of the radial artery. For the arterial pulse and apex beat afford information regarding the movements and condition of the left side of the heart alone, and only during the time that the aortic valves are open. The venous pulse, on the other hand, affords information regarding the movements and condition of the right side of the heart. It gives far more valuable information of what is actually going on inside the chambers of the heart than does the arterial pulse. Therefore, by taking simultaneous tracings of both arterial and venous pulses, we can get information regarding the movements and conditions of both sides of the heart, and it is by comparing these that we are able to obtain a precise and an accurate opinion of the cardiac mechanism.

Now, if a tracing of the jugular pulse taken from a normal individual be studied, in each cardiac cycle three main waves are seen. They indicate a rise of pressure in the vein. The first wave in point of time is due to the contraction of the auricle, and is called the "*a*" wave. The second wave coincides with the

commencement of the contraction of the ventricle, and is synchronous with the carotid beat at the same level of the neck, and is called the "*c*" wave. The third wave occurs towards the end of ventricular systole, and is called the "*v*" wave.

Now, under normal circumstances the stimulus for contraction of the heart arises at the remains of the sinus venosus. From this point the stimulus passes through the auricle to the auriculo-ventricular node and along the auriculo-ventricular bundle to the ventricle. The stimulus is conveyed from fibre to fibre by means of a function of the heart muscle which is called "conductivity." We can estimate the degree of conductivity. It can be done in the following way: As I have indicated, the beginning of the wave *a* corresponds with the commencement of auricular contraction. The beginning of the wave *c* practically corresponds with the commencement of the contraction of the ventricle.

You might say that there is an interval of time between the opening of the aortic valves and the carotid pulse. That is true. But the time is so short (it is only about one-fiftieth of a second) that it need not be taken into account. Therefore the time distance between the beginning of the wave *a* and the commencement of the wave *c* is a measure of the function of conductivity of the heart. It is called the *a–c* interval. In normally acting hearts this interval is almost constant. It does not measure more than one-fifth of a second. If it does, we know that there is a delay in the conduction of the stimulus, and this means that the function of conductivity is depressed. We call it depressed conductivity. This probably indicates some affection of the auriculo-ventricular bundle.

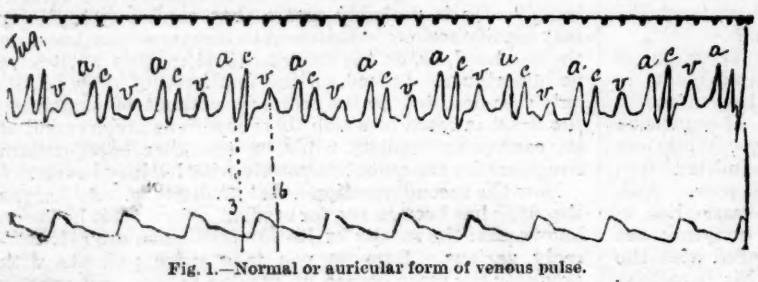

Fig. 1.—Normal or auricular form of venous pulse.

Let me repeat. A normal venous pulse shows three principal waves and in the following order—*a*, *c*, and *v*, and the *a–c* interval is not more than one-fifth of a second. When in a venous pulse the *a* wave is present the form of pulse is called *the auricular form of venous pulse*. The presence of the *a* wave tells us that the auricle is contracting normally. Under what circumstances do we get the auricular form of venous pulse? It is present in two classes—(1) in all normal individuals, and (2) in a large proportion of cases of heart disease. Please remember that it is present in a considerable percentage of cases of heart disease. When in a venous curve there is no sign of the presence of the wave *a* the type of pulse is called *the ventricular form of venous pulse*, in contradistinction to the auricular form of pulse. By the ventricular form of venous pulse we simply mean that there is an absence of an *a* wave. What does the ventricular form of venous pulse indicate? It signifies that the auricle is not contracting in a normal manner. Under what conditions do we get it? We never meet with it in normal individuals, but it is met with in many cases of heart disease. Therefore, if we take all cases of heart disease, whether mitral, aortic, or myocardial, and whether cardiac failure is present or not, we can divide them into two groups—(1) those cases in which the auricular form of venous pulse is present, and (2) those cases in which the ventricular form of venous pulse is present.

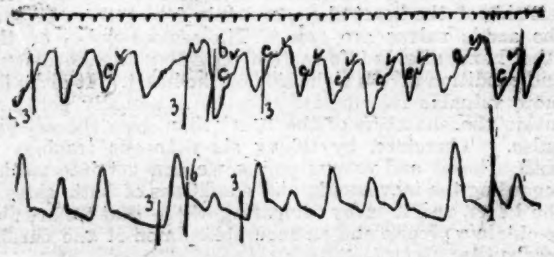

Fig. 2.—Ventricular form of venous pulse.

And now let us see how these facts are related to the subject in which we are interested this evening; and, keeping to the same order, we will take, first, the question of cardiac irregularity. I have already dwelt upon the confusion in regard to its significance. This confusion was perfectly natural, because it was found that some cases of irregularity lived to the normal span of life, and did not develop symptoms of cardiac failure; while others died from cardiac failure, perhaps soon or perhaps only after the lapse of some years. The point is, there were no means of determining the significance of the irregularity in any given case, because there were no means of differentiating the types of irregularity, or what any particular variety signified. Now this is all changed. We are able to classify the vast majority of cases of irregularity into types, and we know what each type signifies, and therefore we have rational and certain grounds for making a diagnosis and prognosis, and, as I shall show you later, in regard to treatment also. So that when a patient comes to us we can with confidence form a tolerably accurate opinion regarding his case.

Now all cases of irregularity, apart from comparatively rare exceptions, fall into one of five groups. I will enumerate them. They are: (1) What is called sinus irregularity, (2) irregularity due to what are called extra-systoles, (3) irregularity due to depressed conductivity, (4) irregularity due to the pulsus alternans, and (5) what may be called complete irregularity.

Sinus irregularity is characterized by a variation in the length of the diastolic period of the different cardiac cycles, the systolic period remaining constant. The irregularity diminishes or disappears with increase of pulse-rate, while it is apt to increase or return with a slowing of the heart.

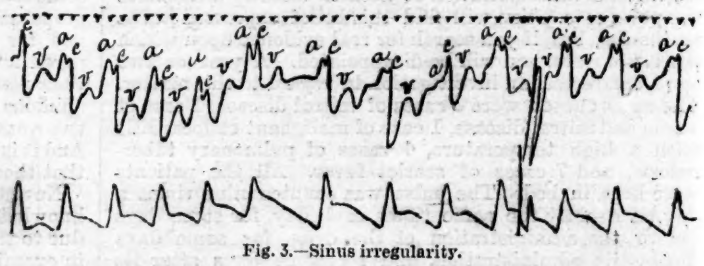

Fig. 3.—Sinus irregularity.

There is frequently a definite relationship to respiration; the irregularity is found best during slow respiration, and may only be present on deep breathing. We may be pretty sure that an irregularity is of the sinus type when there is a definite relationship to respiration. On auscultation, the interval between the first and second sound is constant, while the varying difference in the diastolic period can be made out. A certain diagnosis can be made by taking a polygraphic tracing, and usually a tracing of the radial artery is sufficient. In the case of the latter it will be found that there is no irregularity in regard to the size of the pulse waves, but the intervals between the beats vary, although there are comparatively few sizes of intervals.

Sinus irregularity is much more frequent in the young, but it may occur at all ages. It may occur during the administration of digitalis. The act of swallowing may produce it.

If any subjective symptoms are present, they are almost always merely incidental. What is the significance of this type of irregularity? Suppose that in a given case of irregularity of the heart we can be quite sure that the irregularity is of this type, what prognosis may we give?

The answer is, that the irregularity can be entirely disregarded; it is of no practical importance. No treatment is required.

Extra-systoles.—The second form of irregularity is due to what are called extra-systoles or premature contractions. By an extra-systole is meant a premature contraction of the auricle, or of the ventricle, or of both auricle and ventricle together, while the fundamental or sinus rhythm is maintained.

It is of very great importance to be able to recognize the presence of extra-systoles, because they constitute one of the most frequent causes of irregularity of the pulse, and they may be accompanied by subjective phenomena which cause the patient much distress and alarm.

When extra-systoles are present, the normal rhythm of the heart is interrupted either frequently or occasionally by a premature beat. The pause which follows the premature contraction is abnormally long. This is called the compensatory pause. When this prolonged diastole and the preceding shortened diastole together equal in time two normal cardiac cycles, then the compensatory pause is said to be complete. Since during the prolonged pause the ventricle has had an unusually long

Fig. 4.—Extra-systole marked *. Large amplitude of pulse following extra-systole seen.

period in which to recuperate, the beat of the heart immediately following a compensatory pause often has a greater amplitude than the others. When a premature contraction is interpolated between two normal beats, the form of the extra-systoles is called "interpolated."

On auscultation, in the vast majority of cases two sounds are heard synchronous with each extra-systole. When the premature contraction is so feeble as to fail to open the aortic valves only one sound is heard. Very rarely the extra-systole is so feeble as not to produce any cardiac sounds at all. Auscultatory phenomena are important, because, as I shall show you later, they serve to distinguish extra-systoles from some grades of heart-block.

If an extra systole recurs regularly after each normal beat, so that every normal beat is followed by a single

Fig. 5.—Extra-systole recurring regularly after each normal beat. Simulates pulsus alternans.

extra-systole and compensatory pause, then the pulse beats occur in pairs. The condition is pulsus bigeminus. I may as well mention here that another cause of the

Fig. 6.—Extra-systole so feeble that no wave is palpable at wrist.

pulse beats occurring in pairs is when a patient with auricular fibrillation is getting too large a dose of digitalis.

An extra-systole may be so feeble that no wave is felt at the wrist, so that there is simply a long pause. This gives rise to what is called a "dropped beat" or an "intermittent" pulse. (Fig. 6.) The commonest cause of an intermittent pulse is an extra-systole which fails to reach the wrist. The next most common cause is partial heart-block, to which I shall refer later, and I shall tell you how to distinguish between the two conditions.

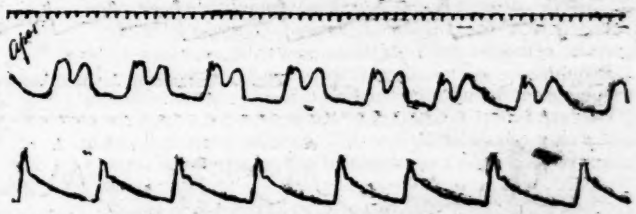

Fig. 7.—A tracing of the apex beat and radial pulse. Shows extra-systole occurring after each normal beat which fails to reach the wrist.

If an extra-systole occurs after each normal beat, and the extra-systole fails to reach the wrist on each occasion, there is halving of the rate of the arterial pulse. (Fig. 7.) This also is apt to be mistaken for partial heart-block, but, as I shall show you later, a differential diagnosis can readily be made.

Extra-systoles may be met with at any age, but they are much more frequent in the middle-aged and elderly than in the young. Indeed, in the elderly they are quite common. They are commoner in men than in women. They are more common in people who are the subjects of heart disease than in those who are not, and are more frequent in cases of cardio-sclerosis than in cases of valvular disease. But it should be remembered that there is a large group of cases in whom extra-systoles are present without any other cardiac abnormality. They may be present in people with a history of rheumatic infection, in excessive tobacco smoking, digestive disturbances, supernormal blood pressure, neurasthenia, and as a result of administration of certain poisons, especially digitalis, aconitine, muscarine, physostygmine, and adrenalin. In a considerable proportion of cases they occur without association with any of these conditions.

An individual with extra-systoles may be quite unconscious of their presence. On the other hand, he may experience sensations, and these may cause worry and anxiety, particularly if they occur after the patient has retired to bed. It is for this reason that it is very important that the nature of the complaint should be recognized. The patient may experience a sensation of fluttering in the chest when a premature beat occurs, or he may be conscious of the long pause and complain that "the heart stops," or the contraction of the heart following the pause may be accompanied by the consciousness of a thud or shock to the chest wall in the region of the heart. This thud may be followed by a feeling of exhaustion. The patient may complain of a sensation of gripping in the throat. Rarely, during a prolonged pause, faintness, sweating, and actual syncope may take place, and the anxiety of the patient may be profound. Even Adams-Stokes syndrome may be simulated.

What is the prognosis of extra-systoles? Unfortunately the public have come to attach a serious significance to them. This is absolutely without foundation. When extra-systoles are considered by themselves—that is, without reference to the conditions with which they may be associated—there is no evidence for supposing that extra-systoles can be taken as an indication of an impaired heart or add to the gravity of an already diseased heart. It is of the utmost importance that you should understand this. You may with absolute confidence reassure your patient.

In regard to treatment, your first duty is to remove any alarm in the mind of the patient. Any associated condition, such as dyspepsia or supernormal blood pressure, should be treated. Some hold the opinion that small doses of digitalis are of value for the irregularity itself. I have used the drug in many cases, and have never seen beneficial results to follow. The bromides are sometimes of value in masking or modifying the symptoms, especially in nervous subjects.

The third form of irregularity is that which may occur when the function of conductivity is depressed. I have

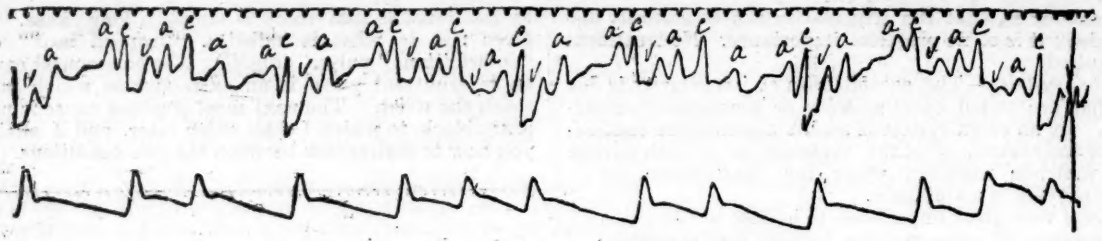

Fig. 8.—Occasional dropped beats due to partial heart-block.

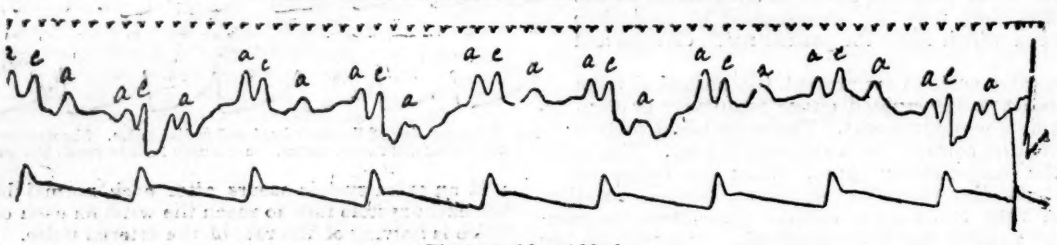

Fig. 9.—2 : 1 heart-block.

shown you that the stimulus passes from auricle to ventricle along the auriculo-ventricular bundle by means of a property called conductivity, and that the stimulus travels at a certain rate. The facility with which impulses pass along this tract may be impaired. There are three grades of impairment: (1) The stimulus from auricle to ventricle is merely delayed—that is, there is merely a prolongation of the interval which separates the commencements of contraction of the auricle and contraction of the ventricle. (2) The stimulus does not at times cross over; in other words, the ventricle does not at times respond to the stimulus from the auricle (this is called "partial heart-block"). And (3) no impulses at all reach the ventricle from the auricle, so that the auricles and ventricles beat quite independently of each other, the ventricles at an approximate rate of 30 per minute (this is called "complete heart-block").

In regard to the first grade, unfortunately it is only recognized with certainty by means of the polygraph. The *a–c* interval is more than a fifth of a second. There may be considerable variations in the *a–c* intervals, and this causes irregularity of the pulse. In regard to this grade of depressed conductivity, it is important to remember that as a rule digitalis is contraindicated.

In the second grade of heart-block "dropped beats" occur. These may only be occasional, or they may be more frequent; each third or fourth impulse may fail to reach the ventricle; or every other impulse may fail to reach the ventricle, which gives rise to halving of the ventricular rate, the condition being spoken of as a 2 : 1 rhythm; or only each third or fourth auricular impulse may be transmitted to the ventricle, and we have 3 : 1 or 4 : 1 heart-block. In some cases of heart-block certain ratios may alternate. (Figs. 8 and 9.)

How may we distinguish between dropped beats which are due to extra-systoles failing to reach the wrist and dropped beats which are due to partial heart-block? Of course, we can do so readily by means of the polygraph. But in the great majority of cases there is a much easier way than this. All that it is necessary to do is to auscultate. In the case of extra-systoles which are not palpable at the wrist, heart sounds are heard during the pause, because the ventricle did contract; but in the case of partial heart-block no heart sounds are heard during the pause, because the ventricle failed to contract.

In the third grade of heart-block, the auricles and ventricles beat quite independently of each other. As you know, the normal auricular rate is between 70 and 80 per minute. The normal ventricular rate is about 30 per minute; that is why the pulse is slow in complete heart-block. (Fig. 10.)

It is not my intention to go fully into the recognition of the various grades of heart-block. It can readily be understood that this is easily possible by the employment of the polygraph, since this instrument affords separate records of the upper and lower chambers of the heart. It is pretty safe to diagnose complete heart-block when the pulse is 36 or under.

In the severe grades of partial heart-block, and in complete heart-block, owing to the excessive slowing of the ventricular rate causing temporary anaemia of the brain, there may be attacks of faintness, giddiness, or temporary loss of consciousness. Adams-Stokes syndrome may be present.

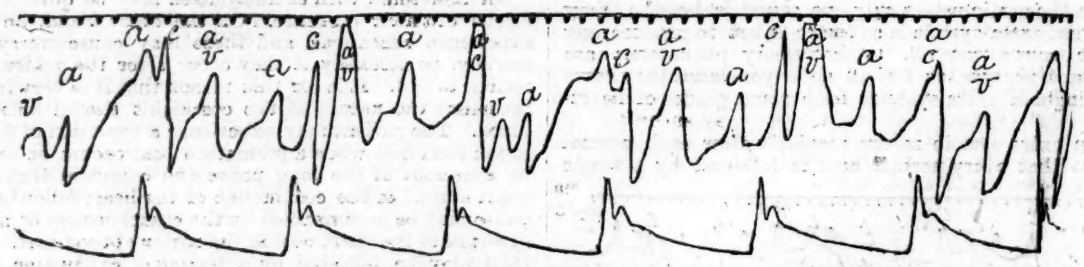

Fig. 10.—Complete heart-block.

I shall not deal fully with the etiology and prognosis of the various grades of heart-block, as they are dealt with pretty fully in the textbooks. The only point I should like to mention is that heart-block of mild degree, giving rise to "dropped beats," sometimes occurs during the course of infective diseases, and is then frequently the only sign of myocardial damage. When present it increases the gravity of the primary disease. As a rule, however, it is temporary.

The fourth form of irregularity is that which is due to the presence of pulsus alternans. By pulsus alternans is meant a condition of the pulse in which the rhythm is perfectly regular, but each alternate beat is large and each alternate beat is small. The condition may be continuous, or it may only be observed by something which increases the pulse-rate—as, for example, exercise—or only during a few cycles immediately following an extra-systole. (Figs. 11 and 12.)

It is very unfortunate, but undoubtedly true, that in the vast majority of cases it is necessary to take a tracing of the radial artery in order to recognize it. Very rarely in cases in which it affects the pulse continuously it is perceptible by the finger. As the sign is of very great importance, we should always be on the look-out for it. On very rare occasions the small beats of pulsus alternans entirely disappear, and the pulse-rate is halved.

What is the significance of pulsus alternans? Well, its mere presence, that is apart from whether it is associated with other signs or not, is of very great importance. It is an indication of very great exhaustion of the heart

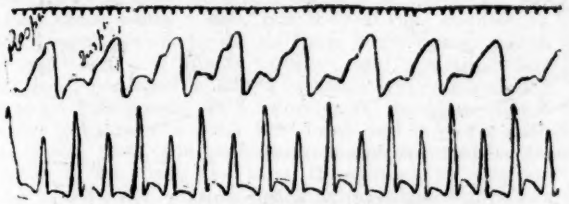

Fig. 11.—Continuous pulsus alternans.

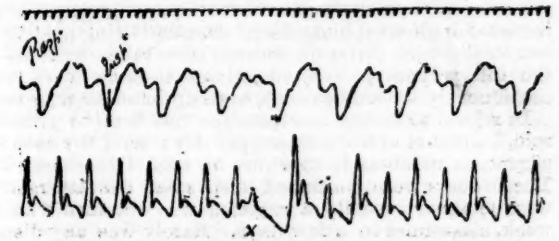

Fig. 12.—Pulsus alternans following extra-systole at *x*.

muscle. When the alternans lasts only for a few cycles, the exhaustion may be only temporary. But even in these cases the prognosis must be very guarded. When the condition is continuous, in other words when it persists for many cycles, death usually follows within a few months, or at most in a few years, and sudden death is not uncommon.

In regard to treatment, absolute and prolonged rest, both physical and mental, is urgently needed.

The last form of irregularity to which I want to draw your attention can be described in one word: the irregularity is *complete*. It is an irregularly irregular pulse.

Rarely or never do two beats of the same character or length follow each other. The irregularity is more pronounced when the pulse is fast. With the slower rates we may have to adopt careful measurements of the tracings, as the variations in the length of pause are only small. The pauses between the beats show no relationship to each other, and there is seldom any relation between the strength of a beat and the length of the pause which preceded it—that is, a strong beat may succeed a short pause, and a weak beat may follow a long pause. The pulse is generally more rapid than normal; it may be very rapid. Many beats of the ventricle may not reach the wrist, especially when the ventricle is beating rapidly. Therefore, the ventricular rate should be counted at the

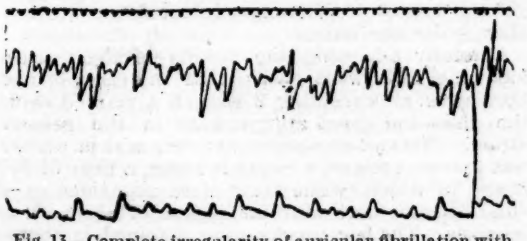

Fig. 13.—Complete irregularity of auricular fibrillation with a fast pulse.

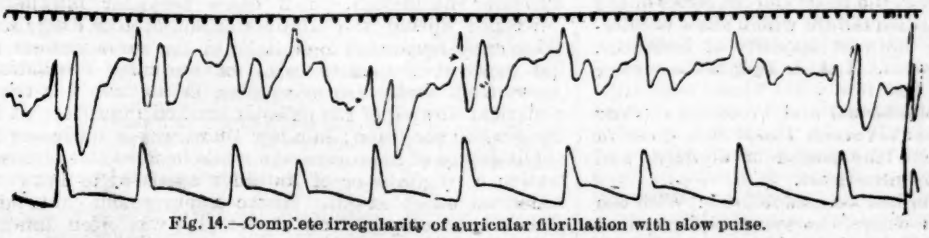

Fig. 14.—Complete irregularity of auricular fibrillation with slow pulse.

apex, either by palpation or auscultation. All the beats may be of small amplitude, but most commonly there is an irregular intermingling of large and small beats.

What may we infer when this type of irregularity is present? We may infer that fibrillation of the auricle is present. Now, gentlemen, the discovery of auricular fibrillation is one of the greatest discoveries in regard to heart affections which has ever been made. It is of tremendous practical importance that the condition should be recognized in regard to the diagnosis, prognosis, and treatment of cardiac disorders. It is a specific clinical condition, and fortunately its recognition is unattended with much difficulty, and can be made with certainty.

What is meant by auricular fibrillation? By it is meant a condition in which co-ordinate contraction in the auricle is replaced by inco-ordinate contraction. Instead of contracting in an orderly and simultaneous manner during systole, the individual fibres contract rapidly and independently of each other. The result is that systole, either partial or complete, of the chamber as a whole never takes place.

What is the effect of auricular fibrillation on the heart? Instead of the ventricle receiving stimuli from the auricle at regular intervals, it receives them at completely irregular intervals, and thus the ventricle is embarrassed in its work. Also, the impulses which escape are numerous, and if the conducting tissues are able to transmit them, the ventricular rate rises. Thus an irregular, and in the vast majority of cases a far too frequent, pulse is produced; the pulse-rate may be as high as 140 or even 180 beats per minute. Very rarely the pulse is very slow. Such a profound change in the action of the ventricle as a rule produces a marked effect on the heart's efficiency.

When auricular fibrillation has once set in, in the majority of cases it persists for the patient's life. But, instead of this, it may appear for a few hours and afterwards never appear, or it may occur at infrequent intervals for weeks or months and then disappear. Many cases of paroxysmal tachycardia are due to auricular fibrillation, and may last for a few seconds, hours, days, weeks, or months. The tendency to occurrence increases, however, until finally the condition becomes permanent. The onset of auricular fibrillation is sudden. As a rule the onset of the symptoms is gradual, but it may be very rapid and cause the patient to become very ill within a few hours. Similarly, if the condition is intermittent, its cessation may be accompanied by an equally rapid and marked improvement in the patient's condition.

What are the symptoms of auricular fibrillation? They are the same as those of cardiac failure from other causes, such as exhaustion, shortness of breath, cyanosis, and dropsy. Patients may also complain of fluttering in the chest and neck or of irregular action of the heart. Apparently, however, they never suffer from angina pectoris. Occasionally there is an absence of symptoms of cardiac failure in auricular fibrillation, and, needless to say, they may be present in heart disease without auricular fibrillation. When the ventricular rate is over 90 per minute as a rule there are symptoms of cardiac failure.

Under what conditions may auricular fibrillation occur? It is found to arise under a variety of conditions. The majority of cases fall within two groups: (1) Those with a history of rheumatism, and (2) patients suffering from cardio-sclerosis. Those with a history of rheumatism frequently have valvular disease, *more often mitral than aortic disease, and especially mitral stenosis.* The condition has been seen in pneumonia, diphtheria, infective endocarditis, and in people dying of exhausting diseases, such as cancer. Digitalis may induce it in predisposed cases. In other words, auricular fibrillation may be present in any organic disease of the heart (mitral, aortic, and myocardial). On the other hand, any organic disease may be present without auricular fibrillation. Therefore, we can divide all organic disease of the heart into two great groups: (1) Those cases with auricular fibrillation, and (2) those cases without it.

Are we able to recognize auricular fibrillation? Yes, with certainty and fairly easily, by the following: (1) The pulse is completely irregular. When the pulse is slow, as, for example, when the patient is under the influence of digitalis, it may be necessary to take a tracing of the

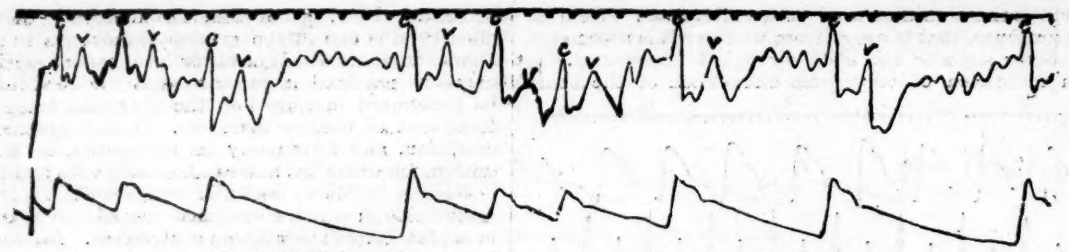

Fig. 15.—Multiple undulations in the venous curve with auricular fibrillation.

radial artery. (2) In mitral stenosis, and if a presystolic bruit, *due to auricular systole*, was present, it disappears with the onset of auricular fibrillation. If a diastolic bruit was present, it persists. A word of warning is necessary here. A murmur filling the whole space between the second and first sounds may be present in cases of rapid heart action, and the latter part of the murmur is not infrequently mistaken for a presystolic murmur due to the systole of the auricle. This mistake need not and should not arise. The murmur is not crescendo in type. On auscultating during one of the long pauses, or when the heart's rate becomes slow, a silence will be detected between the termination of the murmur and the first sound. (3) In a tracing of the jugular vein there is an absence of the normal *a* wave; in other words, there is the ventricular form of venous pulse. The normal *a* wave cannot be present because the auricle does not contract. Instead of the *a* wave, there may be multiple undulations. (Fig. 15.)

In regard to the prognosis of auricular fibrillation, the condition is indicative of some myocardial affection, and, furthermore, it is a specific clinical entity which necessarily has a profound influence on the action of the heart. The prognosis depends upon whether the heart is able to carry on its work under the new rhythm, and this, in turn, depends upon the integrity of the heart muscle. If this be good, for years there may be little or no indication of cardiac failure. In the great majority of cases, however, this is not the case, so that a considerable degree of cardiac failure results. This is especially the case when the pulse is very rapid and there is considerable dilatation of the organ. A persistent pulse-rate of 120 or over is serious. Two points of great importance in trying to form a prognosis of auricular fibrillation are (1) how far is the patient able to modify his life so as to bring it within the limit of the heart's strength, and (2) how does the heart respond to treatment? The latter point will be dealt with more fully later on.

We have now come to the end of what I have to say in regard to the subject of irregularity of the heart. I hope I have shown you that any given case must, apart from rare exceptions, fall into one of five groups, according to its type, and as we know what each type signifies we have certain and rational grounds in regard to diagnosis and prognosis, and, as I shall show you in a few minutes, we have information in regard to treatment also.

And now let us pass on to the problem of digitalis. Why is there such an extraordinary difference in the results of administration of the drug or of its allies in persons who are suffering from identically the same lesion and complaining of precisely the same symptoms? Put briefly, the answer is that the response to digitalis differs according to the condition of the heart and character of the rhythm; those cases of cardiac failure which show wonderfully good results are, in the vast majority of instances, cases of auricular fibrillation. Let me go into the matter in some detail. For the last few years I have been associated with Dr. James Mackenzie and Professor Cushny in conducting at the Mount Vernon Hospital a series of investigations dealing with the action of digitalis, and some of its allies, on the human heart.

Our plan of investigation has been as follows: With the exception of those cases where the symptoms required immediate treatment, all the patients were first given a course of rest before any drug was administered. The rule was not to commence with any drug until the pulse-rate, which had diminished as the result of rest and other causes, had remained stationary for at least some days. This allowed us to study the effect of rest, and it prevented any drug being credited with results which were in reality due to adventitious circumstances.

Each case was daily observed, examined, analysed, and recorded with scrupulous care, attention being paid to the minutest detail. Graphic records were taken by means of the ink polygraph, and sometimes tracings were taken continuously for long periods, even up to an hour or two.

In regard to dosage, our practice has been to give, as a rule, 1 drachm of the tincture per day; or, if the case was urgent, as much as 1½ drachms, or even 2 drachms a day. These doses were continued until some definite reaction was obtained; usually a reaction was obtained within a week, sometimes in a few days. Rarely was any distinct change to be seen before the fourth day of treatment. The drug was then stopped. If afterwards the heart relapsed to its former condition—which happened in a considerable proportion of cases, and usually in about a week—we endeavoured to find the dose which maintained the improved condition without producing any toxic symptoms. After a thorough trial with digitalis, we often tried strophanthus, squills, or one of the other drugs, and then, perhaps, went back to digitalis. We were thus able to find out the relative usefulness of these drugs, and to estimate the comparative dosage.

The first series of cases examined were 21 cases of mitral disease, 11 cases of aortic and mitral disease (in some of these the only evidence of mitral disease was the presence of a mitral systolic murmur), 1 case with aortic systolic murmur, 3 cases of cardio-sclerosis without evidence of valvular disease, 1 case of paroxysmal tachycardia, 1 case of tachycardia of obscure form, 1 case of complete heart-block, 1 case of emphysema with a mitral systolic bruit, and 3 cases of pulmonary tuberculosis with pyrexia. Of the mitral cases, 10 were cases of auricular fibrillation, while 11 were not. Of the aortic and mitral cases, 3 were cases of auricular fibrillation, and 8 were not. The aortic systolic case was not a case of auricular fibrillation. The 3 cases of cardio-sclerosis were cases of auricular fibrillation. Thus, of the 36 cases of valvular disease or cardio-sclerosis, 16 were cases of auricular fibrillation, and 20 were not. The case of emphysema and the 3 cases of pulmonary tuberculosis were not cases of auricular fibrillation.

Carefully analysing the results of these cases, the following facts were elicited: Of the cases of auricular fibrillation, all excepting 2 showed a marked slowing of the pulse and great improvement in the general condition. The two exceptions were one case in which there was pyrexia present, and another case, a man of 67 years of age, in which, while there were no evidences of valvular disease, there were indications of advanced cardio-sclerosis. The best results were obtained in those cases with a rheumatic history. In regard to the cases without auricular fibrillation, in 2 cases auricular fibrillation developed during the administration of the drug, and these cases responded to digitalis in the same manner as did most of the other cases of auricular fibrillation. Apart from these rare exceptions, in no case was there a marked slowing of the pulse or marked improvement in the general condition; in a few there was a moderate or slight degree of improvement; while in most the administration of digitalis or of its allies appeared to have no beneficial effect at all. Where improvement did take place it was comparatively slow, and it was often difficult to be sure how far the improvement was due to the rest in bed and other measures adopted and how far it could be ascribed to the drug. In general the improvement in these cases was accompanied by no definite decrease in the pulse-rate, but in a few auriculo-ventricular block or very marked slowing of both auricle and ventricle

occurred. The slowing in most cases arose from inhibitory action, but in a few cases it arose from direct action on the muscle.

In regard to dosage: as a rule improvement could be started after a time by small doses of 5 minims of the tincture three times a day, but they always required a much longer period to do so than large doses, which produced their full effects rapidly; and sometimes the small doses produced no effect in cases which responded well to the full doses. The inference is, therefore, that it is better to commence with full doses and to go on with these doses until the patient is completely under the influence of the drug, and then, if required, to continue the administration, but to diminish the dose until it is discovered what dose will keep the patient in the best condition. The indications for stopping the drug were the following: (1) Nausea or vomiting, (2) severe headache, (3) diarrhoea, (4) an unduly slow pulse, (5) coupling of the beats in cases of auricular fibrillation, and (6) partial heart-block in cases without auricular fibrillation. With the cessation of the drug, the stomach symptoms passed away.

In cases of auricular fibrillation there was a majority of cases who relapsed to the former condition in about a week after the drug was stopped. Renewed treatment restored the improvement. After a more prolonged course a relapse was often much less severe, and ultimately the improvement could be maintained with comparatively small quantities or with larger amounts taken at intervals of several days. The maintenance of the improvement was one of the most difficult matters to understand. Only great perseverance in each case enabled us to discover what particular dose kept the patient in the best condition. We found a great difference in the amount required. In one case it was as small as 1 drachm per week, while in another it was as large as 45 minims per day. As I have said, we endeavoured to find the dose which maintained the improved condition without producing any toxic symptoms, and in this respect patients were usually able to say what quantity acted best. Having discovered the best dose to maintain the improvement, patients were discharged, and were usually able to resume work while taking the drug. I should like very briefly to describe to you one case of auricular fibrillation to illustrate the kind of experience we had:

A gardener, aged 24, admitted to the Mount Vernon Hospital February 8th, 1910, complaining of weakness, palpitation, and shortness of breath.

History.—Two attacks of rheumatic fever at 12 years of age, and a subsequent attack at 18. Has been indisposed off and on ever since last attack, suffering from giddiness and shortness of breath. During the last year has been unable to work on account of shortness of breath, palpitation, pain in praecordia, swelling of abdomen, and swelling of legs. Has been in St. George's Hospital during the last four months.

State on Admission.—Orthopnoea. Pulse completely irregular, and the rate varies much from time to time, being at one time 117 and at another 88 per minute. There is a large area of cardiac pulsation in the third, fourth, fifth, and sixth interspaces. Transverse diameter of heart 7½ in. At the apex a loud systolic and a soft, short, diastolic bruit audible. The liver is felt pulsating for several inches below the costal margin. Oedema of the legs and hydrothorax are present.

Progress of the Case.—The patient was treated only by rest for ten days, and made a slight improvement, though he at once became worse when he walked a few yards. On February 19th he was put on to 15 minims of tincture of digitalis four times a day. Under the influence of the drug the pulse became slower in a few days, and the patient's condition rapidly improved. After eleven days there was a good deal of nausea, and the drug was stopped. The pulse had come down from 99 to 40. It remained under 50 for six days, when it began to rise and the dyspnoea and palpitation returned. As these phenomena continued, on April 4th digitalis was recommenced. The symptoms steadily improved, and the pulse-rate steadily came down, so that by April 11th, that is after he had taken 10 drachms, the pulse was 44. The drug was then stopped because of vomiting. We then tried him on smaller doses, and after much perseverance we found that his condition was best when he was taking about 100 minims per week. He was discharged on May 29th, feeling well, and has continued at his work, which involves severe physical exertion, ever since.

In cases without auricular fibrillation, in which there had been improvement, the improvement was usually obtained without continuing the drug. This would suggest that rest may have been a more important factor than the drug.

Comparing the different drugs, strophanthus and squills are still supposed to differ somewhat from digitalis in their effects. We found no essential variation in the action of the three drugs on the heart. It required nearly twice the dose of tinctures of strophanthus and of squills as of tincture of digitalis, but the former two showed considerable variation in regard to dosage. In some cases they seemed to have less tendency to cause headache and gastric disturbances than digitalis, but this was not constant. On the other hand, they appeared to have a greater tendency to produce diarrhoea. In no case in which digitalis failed did any of the other members of that group of drugs succeed. On the whole, digitalis appeared to be more certain in its effects than either strophanthus or squills, but some patients seemed to tolerate the last two more easily than digitalis. Therefore they should be regarded as substitutes for digitalis. As I have already stated, aconite had no effect upon the pulse-rate. In no case in which the tincture of digitalis failed did any of the other preparations of that drug succeed. Samples of tincture of digitalis supplied by firms of chemists of repute proved wonderfully constant in strength.

It was found that the active principles of digitalis, strophanthus, and squills readily underwent decomposition when the tincture was diluted with water, and this was especially so in the case of strophanthus. For this reason the tinctures should be dispensed as such or diluted only with alcoholic preparations, with directions to the patients to take them in water, if necessary.

In a paper which I read at the annual meeting of the British Medical Association at Liverpool, and which was published in the BRITISH MEDICAL JOURNAL in September, 1912, I showed from investigations that, judged by the methods in use for observing the blood pressure clinically, the internal administration of digitalis does not raise the blood pressure in man by constricting the peripheral vessels. If that be so, there is no risk in administering the drug in cases of degeneration of the walls of the blood vessels or of supernormal blood pressure.

How does digitalis act in cases of auricular fibrillation? It was supposed that the slowing was inhibitory in origin. This has been found not to be so, for it remains after large doses of atropine. It must arise, therefore, from some direct action on the muscle of the heart. As the auricle continues to fibrillate as before, it may be presumed that the digitalis acts either in the bundle of His or in the ventricle itself. Either fewer impulses reach the ventricle from lessened conductivity in the auriculo-ventricular bundle or the ventricle becomes more refractory; in either case the ventricular rate is reduced.

Now, the practical points which I want you to carry away with you in regard to these and other cases which we have investigated, and from the investigations of other workers, are: Digitalis should not be administered as a mere rule of thumb in all cases of cardiac failure. In any given case, whether there is mitral disease, aortic disease, or disease of the myocardium, you should determine by the means which I have explained to you whether auricular fibrillation is present or not. If fibrillation is present, and it is accompanied by a very rapid pulse, you know that, whatever the lesion, in most cases, and especially in those patients with a history of rheumatism or chorea, you have a therapeutic agency of wonderful potency, and that it is possible to establish and maintain control of the heart-rate. The administration of the drug is followed by a rapid fall in the pulse-rate and a concomitant improvement in the general symptoms. Certainly two exceptions are: (1) Cases of cardio-sclerosis in which the degenerative change is so widespread that little healthy muscle remains; (2) cases in which there is pyrexia. When pyrexia is present, apparently the response to digitalis is as a rule very slight, if at all, whether auricular fibrillation is present or not. It is well to begin with a drachm of the tincture per day, or in urgent cases with even 1½ or 2 drachms per day, and continue until there is nausea or vomiting, diarrhoea, headache, an unduly slow pulse, or what is called "coupling of the beats." Coupling of the beats is a danger signal. We should either stop the drug for a few days or diminish the dose. Usually a reaction is obtained within a week, sometimes in a few days. Then the drug should be stopped until the symptoms have passed away. As a rule the patient relapses. The indication then is to find out what dose suits him best—that is, the dose sufficient to control the heart without producing toxic symptoms. It may require

weeks or even months of careful observation to find this optimum, and much perseverance will generally be required. In this respect help may frequently be obtained from the patient himself, who is often able to say what quantity suits him best; in other words, his own sensations are often a good guide. Having discovered this dose, in the great majority of cases it will be necessary for the patient to continue taking the drug for the remainder of his life. Apparently the cumulative action is not nearly of such serious account as has been supposed. Still the pulse ought to be watched day by day. By this mode of treatment you will save many lives and also bring comparative comfort to people who would otherwise be the subjects of much misery. When auricular fibrillation is not accompanied by a rapid pulse, no marked result follows the administration of digitalis; the result is scarcely greater than in cases without auricular fibrillation. The improvement is slow, and it is often difficult to be certain how far the improvement may be due to the rest in bed and other measures adopted, or to the drug.

If the case is not one of auricular fibrillation you will know that—apart from those exceptional cases in which auricular fibrillation occurs during a course of administration of the drug—as a rule, though, I am glad to say, not in all cases, the beneficial results will be only moderate or slight, or none at all. If improvement does occur, it can usually be maintained without continuing the drug. And, lastly, in regard to the administration of digitalis, it is possible to do harm in cases of diminished conduction.

Apparently, no preparations of the digitalis series of drugs are superior to the tincture of digitalis for ordinary treatment. Strophanthus and squills should be regarded as substitutes for digitalis. They may be tried when a patient is found to be peculiarly intolerant to digitalis.

In regard to the so-called alleged active principles of digitalis, it cannot be too strongly insisted that there is no pharmacological or clinical evidence that they are either pure substances or that different samples of them are uniform in potency. And therefore there is no reason to believe that they are more reliable than, and possibly they are not so reliable as, different samples of the tincture.

In the most acute cases of cardiac failure, when it may be desirable to elicit a more rapid effect than is possible by the administration of tincture of digitalis or one of its allies by the mouth, strophanthin may be administered intravenously, either two or three doses of $\frac{1}{250}$ of a grain at an interval of two hours, or a single dose of $\frac{1}{100}$ of a grain. Marked improvement sometimes follows in from four to eight hours. The action is in every way similar to that obtained by tincture of digitalis by the mouth, except that the same result follows in from four to eight hours instead of in about a week. Whenever necessary, we can continue the administration of tincture of digitalis by the mouth.

I have come to the end of the time at my disposal. My remarks have, on account of time, necessarily been incomplete. But I have tried to solve in some measure the problem of the significance of cardiac irregularity and the problem of the difference in the results following the administration of digitalis.

Many problems still remain to be attacked and solved. But, in conclusion, I venture to reassert the belief that the introduction of graphic methods in the study of heart disorders has been attended with brilliant results, and will compare favourably with any in medicine or surgery which have been introduced in recent years for the benefit of suffering humanity.

MR. P. H. ADAMS, B.M., F.R.C.S., has been elected to the Margaret Ogilvie Readership in Ophthalmology at the University of Oxford.

THE Metropolitan Asylums Board has arranged, for the benefit of candidates for the Diploma in Public Health, a three months' course of lectures and demonstrations in hospital administration—at the Eastern Hospital, Homerton, by Dr. E. W. Goodall, at 2.30 p.m. on Tuesdays and Fridays, beginning April 4th; at the North-Western Hospital, Hampstead, by Dr. J. MacComble, at 5 p.m. on Mondays and Thursdays, beginning April 7th; and at the Grove Hospital, Tooting, by Dr. J. Beggs, at 5 p.m. on Wednesdays and Fridays, beginning on April 25th. The fee for the course is three guineas.

An Address

ON

CERTAIN PHYSICAL SIGNS OF MYOCARDIAL INVOLVEMENT.

DELIVERED AT THE OPENING OF THE NORTH-EAST LONDON POST-GRADUATE COLLEGE,

BY

THOMAS LEWIS, M.D., D.Sc., M.R.C.P.,

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LADIES AND GENTLEMEN,—In my address to you to-day I am going to speak chiefly of acute and subacute affections of the heart. This, as you are well aware, is a wide subject, and involves many problems of complexity, and some which will long remain unsolved.

But in one direction the veil of obscurity is rising a little, and it is to the new facts which have been laid bare and their possible significance that I wish to direct your attention at the present time. I have no doubt that it has been repeatedly impressed upon your minds that, in acute and subacute affections of the heart, the damage is not limited to the membranes which cover the organ both within and without. It is needless to remind you that the myocardium also suffers. Yet in practice our attention tends to direct itself especially to that organ or that portion of an organ which is responsible for evident physical signs. Our conception of a given patient's condition is profoundly affected by the appearance of a pericardial friction rub or endocardial murmur. It is but natural, perhaps, under the circumstances, that our thoughts should focus upon pericardium or heart valve, as the case may be. We are impressed by what we hear through the stethoscope, and our diagnosis, "acute pericarditis" or "acute endocarditis," clearly reveals the trend of these thoughts. It is imperative that the myocardium should not be lost sight of; this warning has been repeatedly uttered. The valve and the pericardial sac are relatively but trivial appendages; the simple loss of one or other, though it may increase the burden of work to be borne by the organ as a whole, is not irremediable. Neither valve nor sac is indispensable; efficient or tolerably efficient work can be undertaken and continued for long, if not normal, periods of time by a heart deprived of one of these structures. That fact is taught quite clearly by clinical experience.

The myocardium is the vital part of the heart; its condition should be now, and in the future inevitably will be, the first consideration in all patients in whom the working power of the heart is to be estimated or aided.

The importance of the myocardium, be it in acute or chronic heart affections, is paramount, whenever we regard our patient from the purely cardiac standpoint. And when I speak of the myocardium, I am thinking not only of the contractile tissue of the ventricle, but also of that of the auricles.

These preliminary remarks bring me to my main topic. It is of great importance that any physical sign which speaks of events which are happening in the muscle of the heart should receive the closest scrutiny, and that we should endeavour to ascertain its exact significance. Certain of these signs it is my purpose to discuss.

The greater part of the myocardium may be termed *silent*, in precisely the same sense that certain of the areas of the brain are so termed. Conspicuous lesions of the ventricular wall may be present and give rise to neither sign nor symptom. Large areas of muscle may be degenerate, and the symptoms and signs may be few and obscure. But as there are certain tracts in the central nervous system which, when affected, produce manifest disturbances, so, as recent work has shown us, there are tracts in the heart which display their injuries in a conspicuous manner. The auriculo-ventricular bundle, as you are aware, is a fine neuro-muscular strand which connects to the musculature of the auricle; in its downward course it divides into two main branches, the right and left divisions of the bundle, each of which is connected to the ventricle by an intricate arborization. This system

formed by the main bundle, the two main divisions and their terminal arborizations, is concerned in maintaining the co-ordinate beating of the cardiac chambers. When the auricle contracts an impulse travels through the main conducting tract, passes into its two chief divisions, and is distributed in the two ventricles. The impulse awakens a ventricular response. The impulse occupies time in passing from auricle to ventricle, and, as an indication of the time taken, we use the interval which elapses between the onsets of contraction of these two chambers (*As–Vs* interval). The *As–Vs* interval, as it is termed, thus becomes an index of the functional integrity of the tract as a whole. It may be estimated clinically with considerable exactitude, for we have means of recording the contraction in auricle and ventricle. The two methods of obtaining an index are the polygraphic and the electro-cardiographic. The *As–Vs* interval as expressed by these two methods varies normally within certain limits. In polygraphic curves the *a–c* interval (representing, *a* the contraction of the auricle, and *c* the impulse in the arteries of the neck) varies from one-tenth to one-fifth of a second. In electro-cardiographic curves the *P–R* interval (representing, *P* the first auricular electric effect, *R* the first ventricular electric effect) varies from 0.12 to, at the most, 0.20 second. Increase in the *As–Vs* interval or a failure of the ventricle to respond to the auricular impulse tells us clinically of deficient action of the auriculo-ventricular tract. These phenomena are spoken of collectively as "heart-block."

Now, chronic heart-block has received much study, and is at the present time one of the most fully understood subjects of modern medicine. Acute and subacute heart-block, though much more frequent, has received far less attention. My remarks will be confined to these last types, and I shall illustrate them freely by brief reports of actual cases.

Acute and Subacute Heart-block in Rheumatic Cases.

We may commence by studying infections of rheumatic origin, for they are of the greatest importance and throw considerable light upon the pathology of chronic rheumatic heart disease. I will cite a characteristic case.

A young girl, who had enjoyed fair health, was admitted under my care at the City of London Hospital, giving a history of palpitation, shortness of breath, and pain in the chest and knees of five weeks' duration. She was very seriously ill, having evident signs of pericarditis and cardiac embarrassment accompanied by commencing signs of oedema of the lungs.

I need not detail the physical signs, but, as a *post-mortem* examination subsequently proved, she was suffering from inflammatory lesions of the pericardium and of all the valves, with the exception of the pulmonary, and that these lesions were clearly of rheumatic origin. Four days after admission irregularity of the heart was observed, and this was proved to be due to heart-black (prolonged *a–c* interval and dropped beats); the heart-block continued until death supervened a fortnight later. A microscopic examination of the heart, undertaken by Dr. Butterfield, revealed perivascular inflammatory lesions of rheumatic type in the myocardium, which, while diffusely scattered in auricle and ventricle, were conspicuous in the region of the central fibrous body, where they had invaded the auriculo-ventricular bundle.

This case, which has been fully described, with the curves,[2] may be taken as our starting point. It represents one of the most severe forms of acute rheumatic heart disease, invading all the layers of that organ and quickly terminating the life of the patient.

It serves as an extreme type of the cases which I shall present to your notice. The appearance of heart-block at an early period of observation was the most emphatic sign which we obtained of myocardial involvement. I do not say it was the only sign, for in this particular instance we should have been led to suspect it from the profoundness of the symptoms, the prostration, the extreme breathlessness and restlessness of our patient. But it is an important case, because we had the rare opportunity of correlating our physical findings, including the graphic records, with a very complete examination of the heart.

A case, which was not dissimilar in many respects, has been reported by Gerhardt.[7] It was a case of acute rheumatic heart affection in which all layers of the organ were involved. But there was this important difference: whereas our case died of the rheumatic affection, Gerhardt's case succumbed, while recovering, from a superadded infection—namely, typhoid. In Gerhardt's case perivascular inflammatory lesions were also found, but while the ventricular muscle did not escape, the bundle showed the chief inflammatory lesion. In this case, too, heart-block was the most positive sign of the myocardial mischief.

My purpose in citing these two cases will be clear. It is to impress the simple fact that the development of heart-block during the course of an acute rheumatic illness is an evidence of myocardial involvement, not necessarily limited to the auriculo-ventricular bundle, but almost certainly spreading to a greater or lesser extent beyond it. The sensitive tract, when implicated, is responsible for signs which, relative to the extent of the lesion, are far more conspicuous than those yielded by implication of the general mass of the ventricular muscle; and I am obliged to cite examples of severe trouble because they alone come to autopsy. The majority of the rheumatic illnesses end in recovery, and this is one of the chief difficulties in studying them. We have largely to judge of the events which have occurred in milder attacks from our findings in those which are severe.

I have notes of another patient, a lad of 14 years, who, having suffered on three occasions from rheumatic fever, was admitted to hospital with frank signs of acute pericarditis. He was for the time being very seriously ill. A large effusion developed which subsided but slowly. Within a few days of admission heart-block was noticed (prolonged *a–c* interval and dropped beats), and this was maintained for a number of days (Fig. 1). Eventually,

Fig. 1.—Polygraphic curves taken from a boy suffering from pericarditis of rheumatic origin. It shows partial heart-block; prolongation of the *a–c* interval and two dropped beats are present.

and as he recovered, the irregularity disappeared, and the *a–c* interval became normal. His heart permanently crippled, he left hospital.

We should stop to ponder the extent of the damage which the myocardium suffers in these severe cases which recover. That it is implicated is certain, that there is partial recovery is equally certain, but that a permanent legacy remains few can doubt.

We have not the opportunities of following the development of a chronic rheumatic heart fully through all its stages in one case. We can but sample our cases here and there, following the disease as a whole in different patients and piecing the history together. Ever and anon a patient succumbs; it may be at an early, it may be at a later period in the history of the affection. We seek what we can find in his remains, but often the morbid process has advanced too far for our needs.

We know the chronic malady to be slow in its completion. Is its progression uniform or does it come in successive and well-defined stages? I believe that we must accept the last view, from the evidence which we possess, and that, while we must recognize that the steps are neither equal in extent nor uniform in their incidence, it is by oft-repeated damage that those incurable rheumatic heart diseases are produced, the unfortunate sufferers from which swell the ranks of our out-patient departments and wards.

We must look for the steps, and the observation of transient heart-block will, I believe, often help us to discover them. This brings us to considerations which I am anxious to emphasize, for the cases already described are those in which none could overlook the signs of infection of the heart. In a very large percentage of the cases of gross heart affection, which from their nature and antecedents may be classed as rheumatic heart disease, no history of grave illness can be obtained. How many young girls come to us with advanced mitral stenosis and degenerate heart muscle and relate the story of a single and mild attack of chorea or rheumatic fever! Yet mitral stenosis does not develop during an attack of either; the advanced lesion is one which has evidently taken a long while in the making. So also has the degenerate muscle

which so often accompanies the valve lesion. The process occurs insidiously, and it is often most difficult to trace its cause.

Now heart-block is not an uncommon accompaniment of acute or subacute rheumatism, and, as in the cases of Cowan, McLeod and Paterson[8] and of Magnus Alsleben,[11] it may be practically the only sign of invasion of the heart. It is generally transient; it is mild in degree, consisting often of a simple prolongation of the *As–Vs* interval. Such simple prolongation of the interval will only become manifest when sought deliberately; it is probably a relatively common event in rheumatic cases, being as a rule overlooked.

But it is seen not only during the actual course of the joint invasion, but also from time to time in rheumatic subjects, apart from such disturbance. I may instance a patient who illustrates this contention.

A young woman of 21 was admitted to hospital for an operation in relief of exophthalmic goitre. The eyes had been prominent for two years; palpitation and the enlarged thyroid had appeared six months previous to admission. She was a rheumatic subject, having had an illness, in which several joints were painful and swollen, at the age of 16, and having suffered from frequent attacks of joint pain in the interval. Her heart exhibited the excited action common in her disease; the ventricular rate was 136 per minute on admission; a little enlargement to the left and a systolic murmur were noted. The greater part of the thyroid was removed at the operation, and the progress of the patient was uninterrupted for the space of six days; on the seventh day the heart became slow (40 to 50 per minute), and occasionally irregular, and this proved to be the result of partial heart-block. There was no fever at the time or subsequently. The further course is important. On the first day of the appearance of the irregularity nearly every second auricular impulse failed to reach the ventricle; on the second day the alternate impulses failed to yield response in the majority of instances (Fig. 2); on the third day the failure of response was much less frequent; on the fourth day the failure of response was not seen, but the *As–Vs* interval, as portrayed in both polygraphic curves and electro-cardiograms, was unduly prolonged (*a–c* and *P–R* intervals from 0.28 to 0.30 second). On the seventh day the interval was still prolonged (Fig. 3), but on the eighth day the prolongation had vanished, and was not again seen, though the patient was repeatedly re-examined.

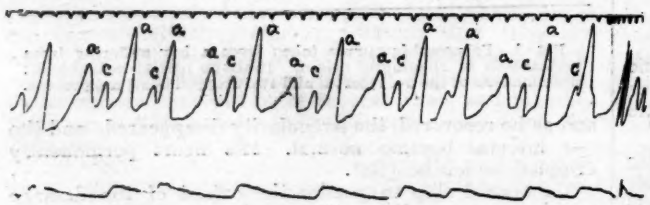


Fig. 2.

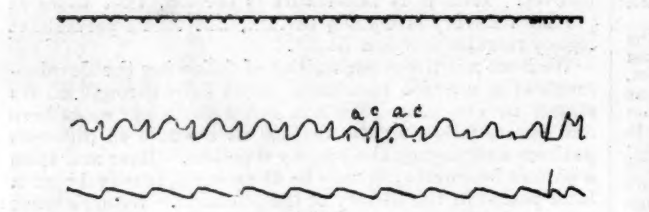


Fig. 3.

Figs. 2 and 3.—Polygraphic curves from a case of exophthalmic goitre. The first curve was taken near the beginning and the second curve near the end of a transient attack of partial heart-block. The patient was a rheumatic subject. Fig. 2 shows very frequent dropped beats. Fig. 3 shows simple prolongation of the *a–c* interval.

The events which were passing in this heart can be readily interpreted; we can imagine the origin of an inflammatory process, situated in the myocardium and involving the junctional fibres; an exudation of leucocytes attended by engorgement of the vessels and tumefaction; later its subsidence, the absorption of the fluids, and the relief of the bundle tension. But what we cannot estimate in this patient is the degree of permanent damage left in the bundle and in the muscle of the heart. That in this or similar cases there is permanent damage most, I think, will agree; and what I suggest to you is that it is precisely in attacks such as these that the foundation of gross rheumatic heart disease is laid. I am inclined to regard an attack of this sort as one of a number of steps which, if they succeed each other, lead to permanent crippling of the heart as a working organ. In the patient in question the step would be an early one, and would not necessarily be repeated. I use it as an illustration from this standpoint, and also because had the attack occurred while the patient was at home it would almost certainly have escaped detection; it occurred without symptoms, and its course was afebrile. How often the susceptible experience such attacks is, of course, unknown at the present time; observation of them is often accidental, and their study demands very numerous fruitless examinations. They are certainly far more common than we have had reason to suppose. I might instance a very similar attack, also afebrile, in a girl of 13 years, who had rheumatic fever a year before I saw her. She sought advice for pains in the neck. The heart was normal in size, but there were early signs of mitral stenosis. The heart-block (Fig. 4) lasted for approximately four weeks, and then subsided entirely.

We may pass to later chapters in the same story. If chronic myocardial disease comes in the manner suggested we may expect to see evidences of the same process in cases in which the heart mischief is already far advanced. These cases are under more constant supervision, and our observations are consequently more numerous. I may cite the essential features of two illustrative cases.

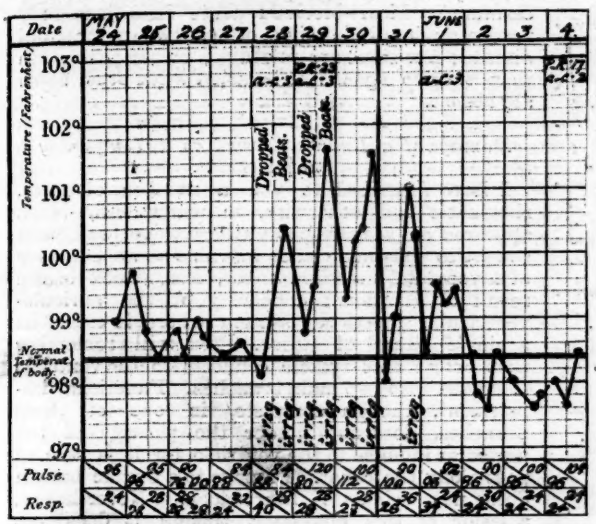
A man of 47 years was admitted to hospital with signs of cardiac failure. He had been the subject of rheumatic fever at the age of 30, and was laid up with pleurisy at the age of 40. For twelve months prior to admission he had noticed shortness of breath and palpitation, following exertion and meals especially. For six weeks there had been pain and swelling in the upper abdomen, and the breathlessness had increased; a little dropsy had been present in the legs for a fortnight. Upon examination he was found to be breathless and cyanosed. The heart's impulse was diffuse; the limits of dullness were increased, lying 1½ and 5 inches to right and left of the mid-sternal line. A faint systolic murmur was audible at the apex. The remaining sounds were natural. The pulse was rather feeble, but it beat regularly at 96 per minute. The liver edge was readily felt two fingerbreadths below the costal margin; the legs pitted considerably with pressure, and so also did the sacrum. The urine contained albumen.

During his stay in hospital he developed a febrile attack of approximately five days' duration, the temperature varying, rising in the evenings to 100° or 101.5°, and falling halfway, or actually to normal, in the early hours of the mornings. With the appearance of the fever, heart-block presented itself in the form of "dropped beats" and prolongation of the *As–Vs* interval. The heart-block was maintained over the febrile period, though it gradually diminished in degree. When the temperature resumed and maintained its normal level, the heart-block subsided and was not again noted (see chart and Figs. 5 and 6). During the attack the remaining physical signs of the heart remained unchanged. The patient left hospital with but little improvement in general condition.

The next case is of interest from several points of view.

Fig. 4.—An electro-cardiogram from a young girl who had early mitral stenosis of rheumatic origin. Prolongation of the *P–R* interval and frequent dropped beats are seen. The heart-block was temporary.

In the first place the heart-block consisted of a simple and temporary prolongation of the *As–Vs* interval; there were no "dropped beats." In the second place, there were other signs of myocardial involvement.



A chart showing a transient attack of fever in a patient suffering from cardiac failure. The chart shows also the days upon which the heart-block was found, and the relation of this disturbance to the febrile attack.

Fig. 5.—A polygraphic curve taken from a case of cardiac failure of rheumatic origin during a febrile attack. It shows frequent dropped beats.

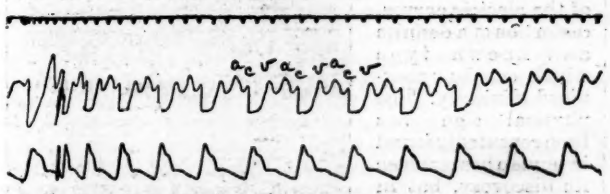


Fig. 6.—A curve showing the recovery. The pulse is now regular, and the *a–c* interval is ⅓ second in duration.

A girl of 13 years was admitted to hospital on July 31st, 1911, complaining of breathlessness on exertion, anaemia, and palpitation, which had been noticed since an attack of rheumatic fever a year before. She had obvious signs of mitral stenosis but there was not much cardiac enlargement. The limits of cardiac dullness lay 1 and 4½ inches to right and left of the mid-sternal line. There were no signs of venous or liver engorgement and no dropsy, but the temperature was raised to 101°. During the next three days the fever subsided. For twelve days it remained normal, and during this period the *As–Vs* interval was found to be normal on three occasions (Fig. 7). Then for a period of five weeks the temperature fluctuated, rising frequently to 99°, 100°, or 101°, sometimes falling to the base line and resting there for a few days, or at the longest a week. Coincidentally the pulse-rate rose, and the child was restive and more breathless. The heart increased in size, until at the end of the febrile period the limits of dullness lay 1½ and 7 inches to right and left of the mid-line. Early in the attack the *As–Vs* interval became slightly but distinctly prolonged (Fig. 8). The course was towards recovery; heart-block was present for a fortnight after the fall of temperature, but eventually cleared up entirely; the cardiac dullness decreased a little in area, but the original area was not regained. The remaining physical signs were not materially affected. The child showed no improvement in general health from first to last, but left the hospital rather worse than better for her stay.

Thus although the heart-block may be transient, as is customarily the case in these patients where its onset is observed, yet the myocardium may, as this case fully illustrates, suffer permanent injury.

It may be asked why the heart-block is so often transient; it is usually temporary because the injury in the acute or subacute stage exceeds that of the period of recovery which follows;* the inflammatory products are absorbed. That damage to the bundle should be permanently manifested

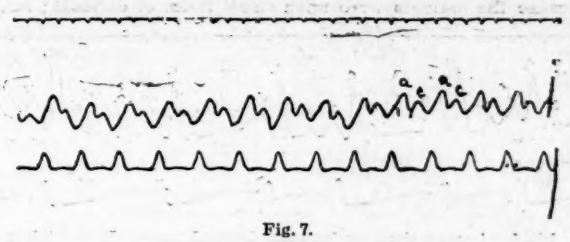


Fig. 7.

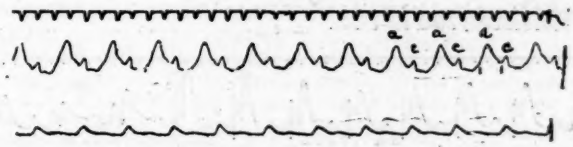


Fig. 8.

Figs. 7 and 8.—Two polygraphic curves from a child who suffered from rheumatic heart disease, including mitral stenosis. Fig. 7 was taken before and Fig. 8 during a period of pyrexia. Fig. 7 shows a normal *a–c* interval. Fig. 8 shows prolongation of this interval. There was subsequent recovery from the heart-block.

in some instances naturally suggests itself. I can call to mind no case in which the onset of heart-block has been witnessed and in which it has remained, but that the bundle is frequently and permanently damaged by rheumatism is fully evidenced by the now well-known fact that permanent increase of the *As–Vs* interval or higher grades of block are by no means infrequent in chronic rheumatic heart disease.

I will leave the case for my contention that heart-block is a valuable sign of myocardial invasion in rheumatic heart disease at this point. I could cite or quote more instances of a similar nature to those which I have related briefly to you, but little could be gained by so doing at present. We require more necropsies than we have at present in confirmation of our clinical conclusions. We require, especially, autopsies in cases from which graphic records have been taken. The field of work is not unpromising, and in this connexion I may quote the words of a pure pathologist who has given special attention to the microscopic lesions of rheumatic heart disease. Aschoff[1] writes: "We do find not infrequently, especially in cases of rheumatic myocarditis, actual destruction of the smaller and larger branches of the conducting system, the already described specific rheumatic nodular structures having a special tendency to develop beneath the endocardium and occasionally right in the connective tissue sheaths of the system."

Heart-block in other Acute Infections.

Amongst the first cases of clinical heart-block which were recorded is the instance reported by Mackenzie.[10] It occurred as a sequel to a severe febrile attack of influenzal origin. Wenckebach[13] has recorded a similar case; the heart-block was noted during the stage of recovery. In rheumatic infections it appears coincidently with the pyrexia, where this is present, as we have seen. Heart-block has also been recorded in pneumonia; in Magnus-Alsleben's case[11] it first appeared while the temperature was falling. I have seen a similar case.

The patient was a carman, aged 27, and the pneumonia was severe. The temperature on admission was 104°; the pulse 160. Respirations were very frequent (56 per minute). The lower lobe of the right lung was involved primarily, and the patient was cyanosed and delirious. On the eighth day there were signs of fresh consolidation in the left lung, and the crisis did not come till the tenth day. The delirium continued for three days

* When the patient is going to die the heart-block remains: I have a good deal of evidence which suggests that many of the patients who enter hospital for what is termed "broken compensation" are in reality suffering from a new, and perhaps fatal, invasion of the myocardium.

after the crisis. Heart-block (frequent dropped beats and a long *a–c* interval) appeared two days after the crisis, and persisted, though subsiding gradually, for ten days (Fig. 9). In this case and in Magnus-Alsleben's, both of which recovered, the question of the myocardial infection was complicated, because the patients were upon small doses of digitalis; but

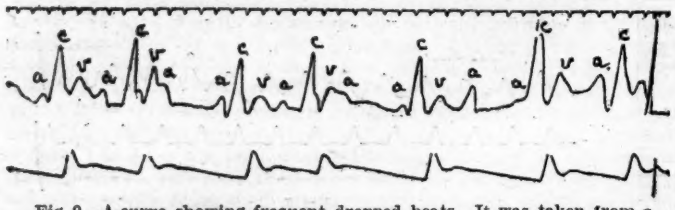


Fig 9.—A curve showing frequent dropped beats. It was taken from a patient admitted for acute pneumonia, and represents the mechanism of the heart shortly after the crisis.

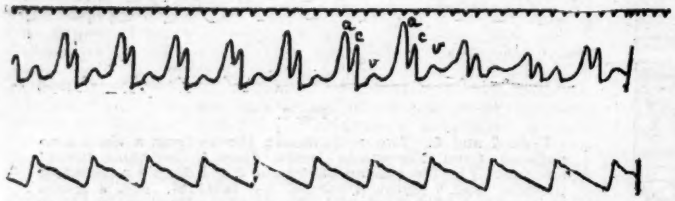


Fig. 10.—From the same case a fortnight later. At this time the heart-block had disappeared. The patient was upon the same doses of digitalis when the two curves were taken.

that the heart-block in my own case was not attributable to this source seemed clear, as the drug (digalen m v, t.d.s.) was withdrawn on the day when the block appeared, and its re-administration as soon as the heart-block subsided failed to reinduce it (Fig. 10).

I have also seen heart-block (dropped beats and long *As–Vs* interval) of a few days' duration as the sole sign of myocardial involvement in a case of infection of the bladder by a coliform organism (Fig. 11); and a case in which there was a mixed invasion of the endocardium by pneumococci and coli has been reported by Cowan, Fleming and Kennedy.[4] The last-mentioned case came to autopsy; while the muscle of the ventricle showed both recent interstitial change and patchy degeneration of the fibres, the heart-block which had been present was accounted for by an inflammatory lesion of the bundle.

A significant instance of acute heart-block as a sign of myocardial disease is found in diphtheria. Three cases (Magnus-Alsleben,[11] Fleming and Kennedy,[6] and Dunn[5]) of the disordered mechanism have been reported in diphtheria; in each the illness terminated the life of the patient. In a fourth but less certain instance (Price and Mackenzie[12]) the issue was the same. The microscopic examination was undertaken in three cases. In Magnus-Alsleben's case the bundle showed parenchymatous degeneration, and is alone described. In Fleming and Kennedy's case a conspicuous inflammatory invasion of the auricular and ventricular muscle which involved the bundle was seen. In Price and Mackenzie's case the lymphatic infiltration of the myocardium was extreme and the bundle itself was free of it.

While heart-block is necessarily, first and foremost, a sign of bundle involvement, it does not signify that demonstrable lesions are always to be found, though in the majority of cases they can be; to us as clinicians the demonstration of functional disability is of equal if not greater import. But, as I have attempted to show, we are justified in utilizing it as a sign upon a broader basis in acute infections. The bundle belongs to the myocardium, and an invasion of the bundle, especially when, as is usual, it happens through vascular channels, can hardly occur without the exposure of the remaining muscle. It may be that under some circumstances the last-named is less susceptible, but the fact remains that the damage is rarely confined to the special tissues. In a measure, therefore, they serve as a gauge for the rest of the myocardium.* Heart-block in acute conditions may not be an infallible sign of general myocardial disease; few signs are infallible, but it is certain that it often speaks of invasion when other signs are absent.

Damage of a Bundle Branch as a Temporary Phenomenon.

I have described to you a number of cases, rheumatic and otherwise, in which heart-block appeared as a transient physical sign, and have sought to convince you of its value as an evidence of myocardial invasion. Now, heart-block is the result of functional deficiency of the auriculo-ventricular junctional system where it exists as a single strand of tissue. You will remember that before this system connects to the ventricle it breaks into two main branches. Functional impairment, though complete, in one of these branches, does not hinder the passage of the auricular impulse to the ventricle, for it is able to pass along the other. Damage to a bundle branch does not originate heart-block. Nevertheless, a lesion of this character, though it does not disturb the rate or regularity of the ventricular beating, can be detected by modern means. The branches of the bundle can no longer be classed with what I have termed the silent mass of myocardium. The physical sign has been but recently described, and it is electro-cardiographic. A lesion of a bundle branch produces conspicuous distortion of the electric curves, distortion of a definite and known type which can be recognized clinically. The physical sign has been repeatedly found in human hearts since its discovery, but in all the cases in which it has been recognized (my own series includes 15 cases) it has been a permanent feature of the curves. I may briefly describe a case which has recently come under my observation, and in which it was transient:

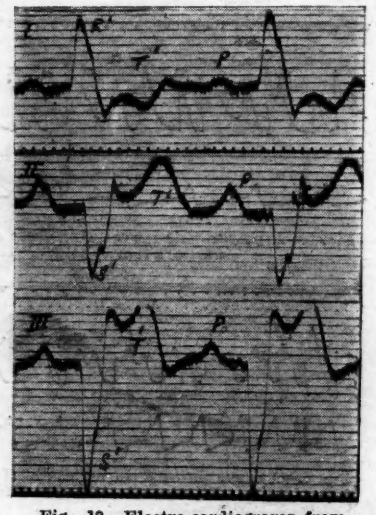


Fig. 12.—Electro-cardiograms from a case of aortic disease, taken on August 18th, 1912, and shortly after the admission of the patient in a slight febrile attack. The heart was beating regularly. Each auricular contraction *P* was succeeded by a ventricular contraction *R'*, *S'*, *T'*, of anomalous form. The type of ventricular curve in the three leads is one which indicates functional impairment of the right branch of the auriculo-ventricular bundle.

A bookbinder, aged 32, who had enjoyed good health until six years previous to his admission to hospital, complained of shortness of breath while walking. This had been present for six years; for several months precordial pain of an aching character was experienced. These were his chief symptoms. He had been

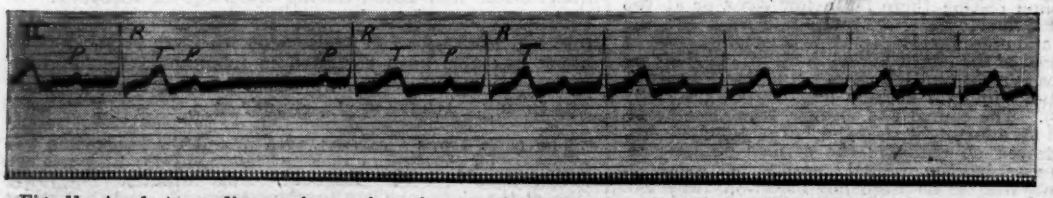


Fig. 11.—An electro-cardiogram from a boy who was admitted to hospital for subacute cystitis, due to a coliform organism. Prolongation of the *P–R* interval and a single dropped beat are seen. The heart-block was transient.

* The case reported by James,[8] in which a deep ulcer invaded the bundle, and that reported by Jellinek and Cooper,[9] in which a localized area of anæmic necrosis, presumably of gonorrhœal origin, affected the upper part of the ventricular septum, do not materially affect the argument.

feeling more seedy than usual for some days, sought advice, and was admitted. He was found to have considerable enlargement of the heart, and free aortic regurgitation was present. The pulse beat perfectly regularly at 64 per minute. There were no signs of venous stasis or of dropsy at his admission, but his temperature was 99°. On the second day it had risen to 100.5°, from which point it gradually fell to normal during the next few days. From this time it remained normal. Electro-cardiograms were taken for the first time on the third day during the pyrexial period; they were of very abnormal type (Fig. 12), and of the form which we now recognize as being characteristic of damage to the right bundle branch. On the succeeding day I had occasion to examine him again, and was surprised to find a complete alteration of the electro-cardiographic pictures. They had reverted to the physiological type (Fig. 13), and this type was maintained during his stay in hospital.

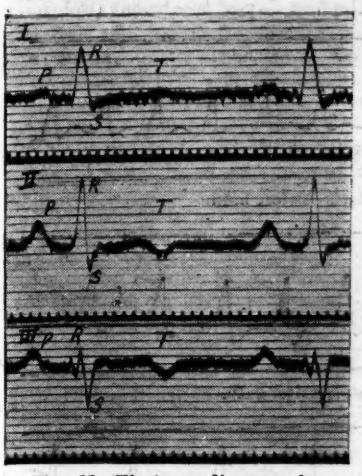


Fig. 13.—Electro-cardiograms from the same case taken on the following day. The heart was beating regularly as before, but the auricular contractions *P*, which themselves remain unaltered in form, are now followed by the physiological type of ventricular curve, indicating in this case the subsidence of the conduction defect in the right branch of the bundle.

The change may be interpreted in precisely the same manner that we have interpreted transient heart-block. It is probable that in this case, too, an invasion of the myocardium—which, from the temperature chart, we should be inclined to regard as infective—happened some little while before admission. The damage of the bundle branch was the sole sign detected, and this sign, like the heart-block of our other cases, was transient. It vanished, and the subsidence of the fever was not long delayed.

This is an isolated instance. I have little doubt that the observation will be often repeated, but as to the actual frequency of the phenomena I have but little knowledge. I have described the sign to you, although its value in general practice is negligible, for it serves to impress the lesson that important events occur in the hearts of our patients which we cannot detect by ordinary means; in the investigation of disease the sign is certainly of importance.

In conclusion, let me remind you that in a very large percentage of chronic heart cases we are unable to trace the cause of the disease; chronic heart disease is not always referable to definite illness from which our patients are known to have suffered; oftentimes the reverse is the case and the disease develops silently. If we can discover any indications which help us to recognize the presence of active processes in these patients from time to time—and such I believe are the physical signs which I have described—our knowledge of the disease moves forward by a distinct step.

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OWING to the greater demands made upon the British Fire Prevention Committee for testing facilities, it has been decided to enlarge the testing station and to add to the plant. The main building is being rearranged so that the principal rooms will be available for the committee's technical and historical collections. It is anticipated that the alterations will be completed early in April, when the testing operations of the new session will be commenced with several tests on fire-resisting doors, various forms of glazing, and some new extinguishers; certain further tests with concrete floors, etc., and with partitioning materials, will also be carried out.

MANIFESTATIONS OF A HEALTHY HEART.

BY

W. BEZLY THORNE, M.D.ST. AND., M.R.C.P.LOND.,

LONDON.

THE novel thesis set forth in Dr. James Mackenzie's article published in your issue of December 21st last, to the effect that irregularities of pulse frequency and functional murmurs are manifestations of a healthy heart, is one which demands careful consideration. I, for my part, beg to submit that those phenomena are partial expressions of a syndrome of which the fundamental conditions have to be sought elsewhere than in the heart. They are, in fact, signs of a consequential impairment of the heart muscle and of the arterial tunica media. They occur in association with a dicrotic pulse characterized by feeble development, or complete absence, of the predicrotic and post-dicrotic waves. The arteries, in fact, do not receive their normal fill of blood, and are practically empty during an undue proportion of the cardiac cycle. Such phenomena point to two defects: an inactive tunica media and consequent deficiency of recoil and of conductivity, and an actual defect of myocardial energy the importance of which is relatively aggravated by the fact of the central organ being called on to perform a considerable part of the work which should be carried out by the arterial heart. Under some circumstances, such as moderate exertion, or even menstruation during a period of invalid repose, the impoverished tunica media seems to pass temporarily out of action. It is easy to understand how great is the danger of heart strain if any effort be persevered in while that condition lasts. The syndrome in question is one of atony of the whole cardio-vascular system.

An almost universal symptom of that condition is an undue degree of postural tachycardia. The pulse is abnormally accelerated by the act of rising from the recumbent or sitting posture, and that acceleration will, in some cases, be indefinitely maintained until a position of repose is resumed.

The murmurs, also, which are so often to be heard in these cases, are so largely influenced by posture that in many instances they subside on the erect position being assumed, and are, in any case, loudest while the patient is in the recumbent position—that is, as Dr. Foxwell pointed out some years ago, while a distended right auricular appendix is pressing on the root of the pulmonary artery. It is difficult to determine whether the systolic apex murmur, which is sometimes to be heard, should be attributed to papillary weakness, to asthenic dilatation of the auriculo-ventricular ring, or to conduction. Dilatation of the pupil is a common feature of these cases, especially in the young. Irregularity of the pulse, if not actually present, is liable to be induced by any additional call on myocardial energy, or by vaso-dilatation however induced; though in the less severe cases the balance may sometimes be redressed by the stimulus of moderate exercise. In some, as has been stated by Dr. Mackenzie, the irregularity follows the respiratory rhythm; that is, the pulse falters synchronously with the descent of the diaphragm. In the majority of cases there is some degree of extension of the area of cardiac dullness. In childhood and adolescence the blood pressure is low.

As regards the etiology of these cases, careful investigation, especially when it can be carried back to the early stage of life, lights on some form of autotoxis. The most common is that of gastro-intestinal origin. In other subjects a rheumatic or gouty taint seems to bear a causative relation to the syndrome. Not a few subjects bear the rachitic stamp in the form of beaded ribs, retraction of the lower part of the sternum, or a tendency to pigeon-breast. But whatever the cause the result is a general impairment of power and efficiency, and a consequently diminished ability to bear strain, whether mental or physical. Such are the children and adolescents who become the subjects of the strain usually attributed to athleticism. Sound and healthy lads do not strain their hearts in ordinary and legitimate forms of game and sport, but those under consideration, short of wind, subject to palpitation and tumultuous action on exertion, and lacking in staying power, albeit full of pluck and will-energy, may meet misfortune in a football match, a paper-chase, a boat-race, or a game of rackets—I quote cases within

my knowledge. Even if they escape some form of breakdown, they plod on with something less than normal energy which may suffice to meet the requirements of a routine life; but they live on a lower plane than is their due. In manhood some are invalided because they are unable to bear the strain of an active life at home or abroad, especially under the influences of a subtropical and humid climate. Others fail in route marching or break down in manœuvres, having persevered, in opposition to their instincts and judgement, under the influence of assurances that there is nothing organically wrong with them, and that their monitory symptoms and their misgivings are "all nerves." As they enter on or pass beyond middle life, the atrophied tunica media and the weakened myocardium being unable to accomplish the treble task of emptying the chambers of the heart, filling the aorta, and then driving the blood through the peripheral vessels, these subjects begin to experience the troubles and disabilities generally referred to as indicative of arteriosclerosis, but, as I would prefer to call it, atrophic dilatation as opposed to the hypertrophy to which the late Dr. Savill gave the name of "arterial hypermyotrophy."

The treatment to be adopted consists primarily in the correction of autotoxis, whether gastro-intestinal, rheumatic, gouty, or due to some pyogenic process. The greatest attention should be paid to diet and general hygiene, exercise being regulated in accordance with the response which may be expected from the circulatory mechanism. Baths and exercises administered according to the Schott-Nauheim method are of great value. Among pharmaceutic remedies, iron is not indicated; digitalis is sometimes useful, but adrenalin, administered by the mouth in doses of from 5 to 10 minims of the hydrochloride solution, stands pre-eminent. Its special office is to bring the tunica media into action, and, it would seem, to restore it to functional efficiency. I have employed it for years, and in every case made frequent manometric observations, which enable me to give unqualified denial to the prevailing suspicion that, thus administered, it raises blood pressure.

It is necessary to add that, during the period of growth and development, progress in the more marked cases is generally slow, and relapse the not uncommon penalty of undue and especially of sustained exertion.

Such in brief are the reasons why I should regard it as a misfortune were it accepted that functional murmurs and irregularities of pulse frequency are manifestations of a healthy heart, and as such to be regarded with complacent acquiescence.

By way of illustration I append the following sphygmograms. Fig. 1 is taken from a youth of 18 who had a functional murmur at the apex from ages 4 to 10. He broke down after a game of rackets at a public school in 1911. The tracing is typical of cardio-vascular atony.

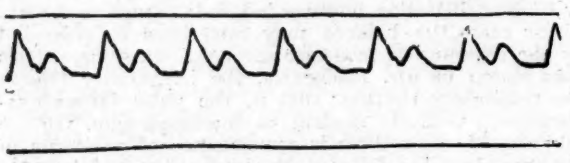

Fig. 1.

Fig. 2 illustrates a severer form of the syndrome, and is taken from a lad of 13, who, after breaking down at school, developed loud apical and basic murmurs in conjunction with dyspnœa, palpitation on exertion, and some cyanosis. After a year's limitation of activity he recovered his health

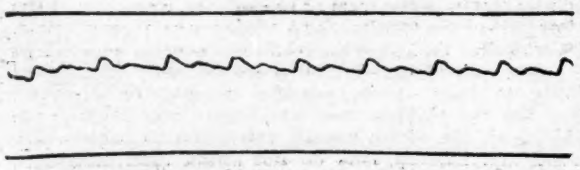

Fig. 2.

to a great extent and the murmurs disappeared. He was then assured by a specialist that he might return to school and join, without restriction, in the usual games. The result was a relapse and a return of the murmurs.

The following illustrate the effects of treatment. Civil engineer, aged 30, treated for cardio-vascular atony in 1900. Health failed in India at the end of 1911. Figs. 3 and 4 were taken on the first day of treatment (February

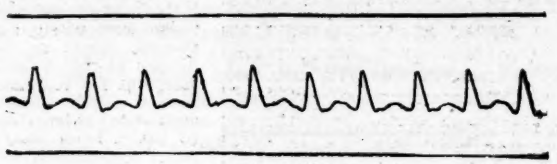

Fig. 3.—Before bath.

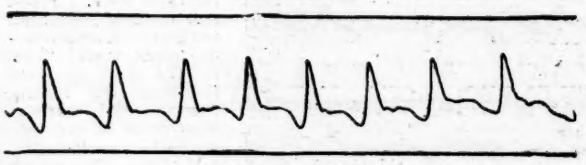

Fig. 4.—After bath.

Fig. 5.—Before eff. bath.

Fig. 6.—After eff. bath.

2nd, 1912); Figs. 5 and 6 on completion (March 7th, 1912). Nauheim baths, adrenalin, gastro-intestinal correctives.

Army officer, aged 39. Nutritional and digestive troubles from childhood. Always "slack." Resigned his commission because he could not spend a day in the saddle nor

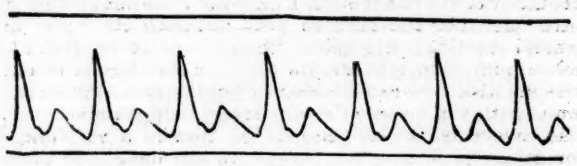

Fig. 7.—Before bath.

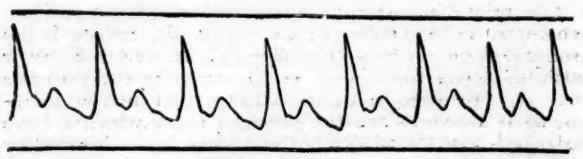

Fig. 8.—After bath.

Fig. 9.—Before eff. bath.

Fig. 10.—After eff. bath.

stand the strain of manœuvres. Figs. 7 and 8 taken on the first day of treatment (August 7th, 1911); Figs. 9 and 10 on completion (September 12th, 1911). Nauheim baths, adrenalin, gastro-intestinal correctives.

THE VENTRICULAR RATE IN COMPLETE HEART-BLOCK.

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IN the great majority of cases published so far, when complete heart-block was present, the spontaneous ventricular rhythm has been between 30 and 40 per minute; most commonly in the neighbourhood of 32. Windle[1] has published a case in which the rate was usually 50, and at times rose to over 60 per minute. Lewis[2] has put on record a case in which, while the auricles were fibrillating, the ventricles beat regularly at about 90 for a few days, and Mackenzie[3] mentions a similar case with a ventricular rate of 70; presumably complete heart-block was temporarily present in these two instances. In spite of these 3 cases it is very generally held that the idio-ventricular rate in man is a very constant one, varying but little from 32 per minute.

During the past year I have come across 2 cases in w h the rate was not infrequently over 50 per minute, and another one in which the rate was as low as 17. I subjoin a short record of the two former, since it may well turn out that a comparatively rapid idio-ventricular rate is less uncommon than usually supposed, cases remaining undetected owing to there being no remarkably slow pulse-rate to call attention to the condition. As a matter of fact, one of the two had been for some time under the observation of a medical man without special attention having been drawn to his heart.

Erlanger and Blackman,[4] having succeeded in producing chronic heart-block in 5 dogs, found that even under normal conditions there was a considerable difference between the lowest and highest ventricular rate. In 1 dog there was a variation of 40 beats per minute (maximum 74, minimum 34), and the average variation for the 5 dogs was nearly 25 beats per minute. Under abnormal conditions—for example, nervous states, running exercise, ether, etc.—the maximum rate was usually much higher. Individual dogs also varied from one another, the lowest under normal conditions averaging 35 beats per minute and the highest 50.

The first case, which I have reported more fully elsewhere,[5] came under observation on April 26th, 1912, and from then up to June 10th showed complete heart-block with the exception of five days in May, when the rhythm was 2 : 1. During these six weeks the ventricular rate varied from 32 to 52 per minute. The slower rate was only seen after a shower of extra-systoles, which were usually produced by exercise. When resting the rate was most usually about 48, but was sometimes approximately 52 for considerable periods.

In the short stretch of tracing seen in Fig. 1 the average ventricular rate is 50 per minute. It will be seen that the rhythm of the ventricles is not perfectly regular, and in other parts of the tracing the irregularity was even more marked. In Dr. Windle's case irregularity was also noted.

In the second case, a man aged 66, who has shown complete heart-block for the past three months, the ventricular rate has varied between 38 and 54, being most frequently between 40 and 50. Fig. 2 shows the ventricles beating at approximately 52, and the auricles at nearly 65 per minute, a very low auriculo-ventricular ratio.

Apart from the possibility of such cases being overlooked altogether, the faster ventricular rate is more likely to give to a simulation of partial block. With the ventricles beating at 32 per minute the auricles have to beat as slow as 64 or as fast as 96 before there can be an appearance of partial block, and these are both rather unusual for the auricles under ordinary conditions. With the ventricles, on the other hand, beating in the neighbourhood of 40 per minute, it is obvious that a partial block must be much more frequently simulated, since the human heart commonly varies between 70 and 90 under conditions of rest or mild exercise. Wardrop Griffith has recorded 2 cases in which the difficulty of distinguishing between complete and partial block was considerable. Erlanger,[6] in his classical experiments, sometimes found the same difficulty. He says: "Occasionally the ventricular rate in complete block may be an aliquot part of the auricular rate over long intervals of time, and in such instances the ventricular beats may so follow the auricular beats as to appear to be caused by them."

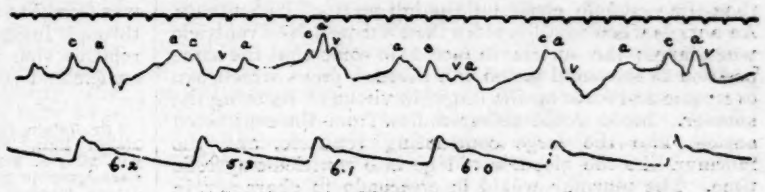

Fig. 1.

Fig. 2.

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THE AURICLE IN MITRAL STENOSIS.

BY
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MENTONE.

THE somewhat complex series of murmurs audible during the course of a case of mitral stenosis seem to me to find an easy and natural explanation if it be granted that the contraction of the auricle may not cease when that of the ventricle commences, but may continue for a longer or shorter period to overlap it.

Such an assumption is by no means unreasonable.

The late Professor Potain always maintained, basing his conclusions on repeated observations, that the contraction of the auricle continued normally till the time of opening of the aortic valves.[1] Dr. Barclay wrote: "The two cavities (auricle and ventricle) do not contract and dilate alternately, but the contraction of the one overlaps to some extent that of the other."[2] Roy and Adami gave a series of simultaneous curves, showing the relation in time of the principal elements which united constitute the heart-beat. Those curves show the contraction of the auricle maintained in full force into the time of the outflow of blood from the ventricle into the aorta.[3] Dr. Galabin, commenting on his heart curves, and on those of Professor Marey, wrote: "From a comparison with Marey's tracings we have come to the conclusion that the beginning of the ventricular rise coincides with the first increase of the intraventricular pressure, whereas the auriculo-ventricular valves appear in general to close when the half or the third of the ventricular rise is accomplished."[4]

I am, therefore, not astonished that Dr. James Mackenzie says: "The curves of auricular pressure by different physiologists are very perplexing, some getting a rise of varying duration during ventricular systole."[5]

Now in mitral stenosis a tendency for the auricle to prolong its contraction still further is to be expected, as it would take longer to expel its contents through a stenosed than through a widely open orifice, and considerable evidence has accumulated to indicate that this is so.

If, then, the auricle in mitral stenosis can prolong its

contraction into ventriculo-systolic time, the following results would occur:

1. The presystolic murmur would go up to and into the first sound.

It would not necessarily stop with the advent of the first sound, for, as I showed in my article in the BRITISH MEDICAL JOURNAL of January 11th, 1913, the pressure on its contents which a contracting auricle can exert varies, roughly, inversely as the cube of its diameter.

The auricle having expelled most of its contents into the ventricle before the contraction of the latter commences, it could contract on the residue of its contents with far greater effect, and exert a far greater pressure, than the ventricle could on the full total of its contents. An auricle when small is more than a match for a ventricle when large; the auricle, in fact, is in somewhat the same position as the small piston of a Bramah press, which can overcome and force up the larger in virtue of its being the smaller. Blood would therefore flow from the contracted auricle into the large contracting ventricle, and the murmur, like the blood, would go into ventriculo-systolic time. The murmur would be crescendo in character, in harmony with the increasing pressure under which, as it contracts, the auricle can expel its residual contents into the ventricle. (In my communication "On the Genesis of the Venous Pulse"[7] I pointed out why regurgitation from the auricle, in the absence of valves at the great veins, could not occur.)

2. A systolic murmur might be absent for years, though the auriculo-ventricular valve was incompetent.

Patients with mitral stenosis often live for long periods without any signs of regurgitation occurring, yet the auriculo-ventricular valve suggests from its appearance after death that it has been incompetent through, perhaps, most of the time. Why has this incompetent valve not leaked? or why has it leaked only towards the end of the illness? The rounded, hypertrophied auricle one often finds in these cases[6] has for a long period prevented regurgitation by prolonging its contraction into ventriculo-systolic time. It has nearly emptied itself and become small—say, half its initial diameter—by the time the ventricle starts contracting, and it continues to try and drive its residual contents into the ventricle. It could now exert greater pressure on its contents, urging them forwards, than the ventricle could oppose to them, for the ventricle can never raise a pressure greater than that in the aorta without its contents escaping into it.

The auricle, therefore, would allow no regurgitation from the ventricle so long as the auricular contraction continued, and consequently the incompetent stenosed mitral valve would not leak. In fact, any leak would, so to speak, take place forwards from the auricle to the ventricle during the early part of ventricular contraction in cases of mitral stenosis accompanied with an auriculo-systolic murmur.

Incidentally it is interesting, as showing what auricles may do, to recall the case observed by Allan Burns where the ventricles were calcified, and the auricles had accomplished for a long time the whole work of the circulation.[8]

3. A systolic regurgitant murmur would replace the presystolic crescendo murmur when the auricle failed to contract to a sufficiently small chamber before the oncome of the ventricular systole.

If the auricle does not get small in time, because of the difficulty of expelling its contents quickly enough into the ventricle, the oncome of the ventricular systole would catch it before it had the physical advantage of being small enough to exert sufficient pressure on its residual contents to match or master the ventricle. Regurgitation into the auricle would then occur, a systolic murmur appear, the auricle would speedily dilate, and cardiac breakdown take place.

Rest or bleeding might temporarily give the auricle a chance of recovering its function, and becoming small in time to oppose the ventricular contraction. In that case the systolic murmur would again disappear, and be replaced by the presystolic. In time the breakdown would occur again in the same way, and probably be permanent, the auricle remaining dilated, and allowing regurgitation from the ventricle.

As soon as it is recognized that the auricle may be to the ventricle what David was to Goliath, simply because it starts first, the auricle will "come into its own" and be respected as it deserves. Not recognizing this has misled and wronged many a good observer. Dr. Barclay wrote: "The more powerful contraction of the ventricle must overcome that of the auricle if there exists anything like antagonism between them." This false conclusion must have made it very difficult for him to accept the evidence of his own senses and affirm so correctly that "the essential character of this (presystolic) murmur is that it continues up to the first sound, *during* which it ceases."[9]

Dr. Dickinson, on the other hand, because the auriculo-systolic murmur was heard by him during the apex beat (as also it was by Professor Potain) concluded that it must be ventriculo-systolic in origin and regurgitant.[10] He was forced to a false interpretation of a true observation through imagining relative muscle was everything and relative size was nothing in any struggle between the auricle and ventricle.

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The Goulstonian Lectures

ON

DEATH BY ELECTRIC CURRENTS AND BY LIGHTNING.

DELIVERED BEFORE THE ROYAL COLLEGE OF PHYSICIANS OF LONDON.

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LECTURE II.—DEATH BY ELECTRIC CURRENTS (*concluded*).

SOME excellent experiments further illustrating the importance, so far as life is concerned, of the quantity of current traversing the thorax in electric accidents were published in 1911 by Weiss and by Zacon. These were made on dogs anaesthetized with chloral; the electrodes were placed either in the mouth and rectum or on the head and leg, and the amperage, voltage, and the duration of the current received by the animal in each case were noted. Tracings of the femoral blood pressure and the respiratory movements are given. These authors concluded that the resistance of the dog's tissues to alternating currents (12 to 75 periods per second) was the same as to continuous currents, and that chloral anaesthesia gave no protection against electric shocks. With alternating currents given for a few seconds, death would occur when about 70 to 100 milliamperes traversed the thorax with the heart *en route;* with continuous currents, death was not caused unless the current was as large as 300 milliamperes, roughly speaking. If, however, smaller electric currents were administered for long periods, it was found possible to produce death by tetanus and asphyxia; thus currents of 35 to 45 millamperes were too small to produce cardiac fibrillation, but after about ten minutes' application caused death by continued inability to breathe, and slow asphyxiation. It was observed that large currents—400 milliamperes or more—could be passed through the head with comparative impunity, the heart continuing to beat though rather irregularly, and the respiration stopping only for so long (35 and 58 seconds in two instances) as the current passed. With still large currents, however, thus passed through the head and central nervous system, respiration might fail to begin again when the current was turned off, and death from asphyxia would then occur. The resistance of the animals generally diminished about 10 per cent. during the passage of the current.

Death by Alternating Currents of High Frequency.

It is necessary to go back a little at this point and consider more carefully the frequency of the alternating currents that have been used to produce death. Hitherto I have considered only the ordinary alternating currents that are so widely used domestically and industrially, in which the direction of the current is changed perhaps from 50 to 300 times in a second. Such currents are, as we have just seen, three or four times as dangerous to the life of animals, *cæteris paribus*, as continuous currents. The question arises: How far does the rate per second of these alternations affect the dangerousness of these currents? The answering is extremely surprising and interesting. In 1891 Tesla, in America, experimented with alternating currents in which the number of alternations per second was very great indeed, and found that very large quantities of electricity could be passed with impunity through the human body when at these very high rates of alternation. Thus, d'Arsonval (1892), using currents alternating from 400,000 to 1,000,000 times a second, found he could pass as much as 1 ampere through his body with impunity, and later (1893) took currents up to 3 amperes. These currents were twenty or thirty times as large as those required, under similar conditions, to cause death in the case of the ordinary alternating currents at much lower frequencies and pressures. Yet he felt no painful sensation while they traversed his body; there was no burning of the tissues at the points where these large currents entered and left him, and his muscles were not thrown into tetanus. Various explanations of these observations were offered. Jones (1893) assumed that, as a matter of fact, the currents passing through the body were to be measured in milliamperes rather than in amperes, its effective resistance being immensely increased by the high rate of frequency of the alternations; similar explanations were offered by Hedley and by Swinton. Others assumed that such high-frequency currents travelled by the surface of the body only, and did not penetrate to the deeper tissues owing to the very brief duration of each alternation. Sutherland quoted the view that one alternation might not have passed fully through the body before it was wholly or partly neutralized by the succeeding current of opposite sign, a view that is quite unimaginable to an electrician. The most reasonable and, no doubt, the correct explanation was furnished by d'Arsonval, who assumed that human muscle and nerve are so constituted as to be insensitive to alternating currents of very high frequency. The same explanation was given by Thomson (1894), who found that, using currents of over 10,000 alternations a second and very high voltage (100,000 to 200,000 volts), he could take a current, equal in heating effect to over 1 ampere of ordinary current, from one hand to the other, without pain and with only a moderate sensation of warmth at the points where the current entered and left the skin. Using electrodes with a surface of 6 sq. in., he found the virtual resistance of the human body from hand to hand to be about 700 ohms; using his two hands and wrists immersed in saline solution as electrodes, he could take a current of 1.5 amperes, the body absorbing power at the rate of 800 watts, without appearing to be in any way injured by it. In other words, alternating currents at these high frequencies were at least twenty or thirty times less dangerous to human life than alternating currents of the ordinary frequencies—25 to 150 cycles a second—used industrially. That animals can be killed by these alternating currents of very high frequency was shown by Bordier and Lecomte, among others; a couple of rabbits after receiving currents of 300 and 400 milliamperes for a minute became paraplegic, and died in twelve and fourteen days, and a third rabbit died in general tetanus from failure of the respiration two minutes after having a current of 500 milliamperes passed through it for thirteen minutes. Similar results were obtained with guinea-pigs and rats. Kennelly and Alexanderson have recently made further experiments with high-frequency currents of various frequencies. The experimenter's hands were placed in vessels full of saline solution, and the current was sent across from one hand to the other. At the slow rate of 60 alternations a second, only 8 milliamperes (at 5 or 6 volts) could be borne; at 11,000 alternations (12 to 20 volts) 30 milliamperes could be taken, and at 100,000 alternations (200 to 360 volts) no less than 800 milliamperes. If high-frequency currents are passed through animals for long periods they may succumb to the heating effects of the currents, as d'Arsonval has shown (Bordier and Lecomte).

Some admirable investigations into the influence of the alternations on the morbidity, so to speak, of alternating currents were made in 1900 by Prevost and Battelli. Using dogs as the subject for experiment, they found that the optimum or most fatal frequence was about 150 alternations per second. Thus, using a continuous current, and with the electrodes in the mouth and rectum, different dogs required pressures of from 50 to 80 volts to produce death by cardiac fibrillation. When the continuous current was replaced by an alternating one, it was found that with alternations up to 150 a second currents at only from 15 to 25 volts were needed to produce death; at 200 alternations a second 40 volts were necessary; at 300 alternations, 50 volts. An alternating current of 350 alternations a second was about as fatal as the continuous current; at 500 alternations 150 volts were needed to produce death, and at 1,720 alternations a second no less than 400 volts. In other words, the cardiac muscle of the dog, and in all probability that of man too, is least tolerant of alternating currents at a frequency of 150 alternations a second; it is about three times as tolerant of continuous currents, and about twenty times as tolerant of alternating currents of the relatively high frequency of 1,720 alternations a second. There is no doubt that this must rest on some physiological property of the heart muscle; one may compare the fact, noted by d'Arsonval and by Thomson, that high-frequency currents taken by the hands are painless, even at a strength of 2 or 3 amperes, whereas even so little as 20 or 30 milliamperes of an ordinary low-frequency alternating current taken in the same way give rise to tetanus and very severe pain indeed; Trotter found the pain of a 35 milliampere continuous current taken for three seconds through an area of four or five square inches of his hand almost insupportable. Deaths by electricity would be very much fewer than they are now if high-frequency currents could be used in place of the ordinary alternating and continuous currents universally employed. Hence it is a thousand pities that the economical production of high-frequency currents on the commercial scale is not possible for mechanical reasons, and that the electrical properties of such currents unfit them for industrial usage.

Summary of the Experimental Results.

The chief experimental results obtained in the electrocution of animals by both alternating and continuous currents have now been placed before you, and they may conveniently be summarized here under a number of different heads.

I. Living animals of different species are killed by electricity with very different degrees of facility. For example, many experimenters have endeavoured to electrocute frogs, but all, I believe, without success, whatever the current used and however it may have been applied. The frog survives electric shocks and the prolonged passage of electric currents at all sorts of voltages—10, 100, 1,000 volts and more—and shocks from induction coils and charged Leyden jars. The only inconveniences it suffers appear to be transient pareses or paralyses, and, in the case of strong currents passed for many seconds or minutes, the formation of burns. The frog is thus immune because its heart always begins to beat again regularly and normally after the passage of the electric current, and because its respiration does the same; and also, as Priestley pointed out in 1767, because "its constitution enables it to subsist a long time without breathing." At the other extreme of the scale comes the dog, which can be killed with certainty by an alternating current of perhaps 15 volts or 60 milliamperes applied so as to pass largely through the heart muscle for a couple of seconds only. The dog is very easily killed by electricity because its heart muscle is thrown into a state of fibrillary contraction by comparatively weak currents, and very rarely (except in the puppy) can recover from the fibrillation and beat normally again. In addition, there is the fact that currents that are too strong to throw the dog's heart into a state of fibrillation are yet able to kill the animal by respiratory paralysis and asphyxia, so that a current that may not be fatal to the dog by its action on the heart

may yet kill it by action on its central nervous system. Birds and other living creatures—such as apes, horses, cats, rabbits, guinea-pigs, rats, mice, and so forth—appear to come between the frog and the dog in the scale of liability to death by electricity at relatively low voltages, the rat's heart always recovering spontaneously from the state of fibrillation into which it is thrown during the passage of the current, the rabbit's heart often recovering spontaneously, the guinea-pig's rarely, the adult dog's never. It is generally found that young animals are less easily killed by electricity, other things being equal, than adults of the same species; thus Battelli found that cardiac fibrillation would cease spontaneously in electrocuted newly-born puppies, though not in adult dogs, and Kronecker[17] has produced transient cardiac fibrillation by electrization of the heart of a newly-born child with ectopia cordis, though there is no reason to suppose that this fibrillation is ever recovered from by adult human beings in whom it has been induced—a point, however, about which we have no certain knowledge. In the case of discharges from Leyden jars and condensers, the young animal is killed by relatively smaller quantities of electrical energy than the adult. It should be added that different animals of the same species often show different degrees of susceptibility to electric currents that can only be explained by idiosyncrasy.

II. The sudden or rapid death of animals killed by the application of electric currents may be brought about experimentally in several different ways, of which the following are the most important:

(*a*) By asphyxia due to prolonged muscular tetanus and inability to perform the movements necessary for respiration, when the current is passed and the tetanus maintained for as many minutes as are necessary to complete asphyxia. The heart in these circumstances goes on beating to the end. A dog may take ten minutes to succumb in this way (Weiss); presumably living and breathing creatures of any kind could be killed by this method.

(*b*) By primary heart failure. In a typical case, the heart muscle is thrown into a state of fibrillary contraction, and the heart ceases to beat as soon as the current is turned on, while respiration continues. When this happens the blood pressure in the femoral artery falls steadily, reaching zero in ten or fifteen seconds in the case of the dog; should the heart for any reason begin to beat again, the animal will probably recover—the rat always recovers thus, the dog hardly ever.

(*c*) By primary failure of the respiration, due to the action of the electric current on the central nervous system, or Brown-Séquard's inhibition. Animals apparently killed in this way will often recover if artificial respiration is perseveringly carried out. This mode of death occurs when large currents at high voltages are sent through the body.

(*d*) By simultaneous failure of both heart and respiration; seen, for example, in dogs receiving an alternating current at from 240 to 600 volts for two seconds, from mouth to rectum.

(*e*) Death may occur after the lapse of hours or days, as the result of the injuries to the tissues caused by the passage of strong currents.

III. After being exposed to currents of high voltage, say 600 volts and over, animals tend to show a number of signs that indicate grave involvement of the central nervous system. This is more marked in small animals than in large, other things being equal, as the current density will be greater in the smaller animal. Such signs are arrest of respiration and its resumption in an irregular manner; the occurrence of clonic spasms (such as are not seen in man); loss of sensation and the reflexes; great prostration and slow recovery. All these phenomena are absent when one is dealing with electric currents of low electromotive force. They may be taken as evidence of nervous shock or Brown-Séquard's inhibition.

Special mention may be made at this point of the "electric sleep" produced by Robinovitch in animals by the use of interrupted continuous-currents (the so-called "Leduc currents") at from 5 to 10 volts and about 1 milliampere. The cathode is applied to the head, the anode to the trunk, of the animal. This electric sleep may be kept up for eight hours or more; it is associated with a rise in the arterial blood pressure, and is said by Robinovitch to be due to central inhibition.

IV. The particular electrical details and considerations that determine whether a certain electric current will be fatal or not to an animal in any given instance are very complicated. Hence it is not possible to say off-hand that a current of such-and-such a voltage or character or strength will cause death; there are at least six factors that must be considered separately here, although when one comes to work out their influence in any particular instance they must be considered together.

(*a*) *The Voltage of the Current.*—Given the optimum conditions, continuous currents are not fatal to dogs at voltages below about 60 volts. An ordinary alternating current at 15 volts will kill a dog, and a similar current at any voltage up to about 600 volts will be equally effective, by causing the dog's heart to fibrillate. But the alternating currents passing at pressures of from 1,200 to 4,800 volts, administered under the same optimum conditions, are not necessarily fatal, because they are too large to cause the dog's heart muscle to fibrillate; although if continued long enough they may cause death by permanent paralysis of the respiratory centre.

(*b*) *The Amperage of the Current.*—Given the optimum conditions for causing death—that is to say, such an arrangement of the electrodes as will cause the current to traverse that part of the thorax in which the heart lies—the dog will be killed by an alternating current of as little as 70 milliamperes or a continuous current three or four times as great. But the very much larger currents forced through the thorax by much higher voltages—1,000 to 5,000 volts—are not fatal, because they do not throw the heart into a state of fibrillation; thus Weiss passed an alternating current of 7 amperes (at 4,600 volts) through a dog weighing 22 lb. for three seconds without killing it. These large currents may prove rapidly fatal by respiratory paralysis, or, after the lapse of days, by the burns and other injuries they may have inflicted on the tissues at the electrodes.

(*c*) *The Duration of the Current.*—The time during which the animal is exposed to the current is of great importance. As has been mentioned already, quite small currents at low voltages, that have no apparent influence on the action of the heart or on the central nervous system, but are strong enough to tetanize the muscles, may cause death by asphyxia if kept on for long enough—over ten minutes in the case of the dog. With the stronger currents at higher voltages, that kill by cardiac fibrillation, Battelli found that contacts up to one second in duration were often not fatal to the dog, though contacts of from one to three seconds invariably were fatal. Weiss showed that alternating currents as small as 70 milliamperes passing through the thorax required not less than four or five seconds to produce a fatal result. Again, with very high voltages (several thousand volts) and alternating currents of several amperes, with which death when it occurs is due to injury of the central nervous system, the passage of the current for several seconds may be survived by a large animal, though one second may be fatal to a small animal of the same species. Crile and Macleod found alternating currents at 2,300 volts fatal to anaesthetized dogs in twenty seconds, but not necessarily fatal in one, five, or ten seconds. The same thing is seen with continuous currents. Some of the differences seen here between different animals of the same species must be set down to idiosyncrasy.

(*d*) *The Character of the Current, Continuous or Alternating.* — Continuous currents, whether from a dynamo or a battery, are much less dangerous at comparatively low voltages than the ordinary alternating currents used industrially. Thus a continuous current applied for a few seconds will not be fatal to a dog below pressures of 60 or 70 volts, while an alternating current with from 25 to 150 periods a second will be fatal at a pressure of 10, 15, or 20 volts. But at higher pressures, where death, when it occurs, is due to failure of the respiration by nervous inhibition, the continuous current may be the more dangerous of the two, because its passage is the more injurious to the central nervous system. Thus an alternating current at 600 volts passed from the head to the feet of a rabbit for three seconds may do it little injury, while a continuous current of 550 volts electromotive force may be fatal to it in one second in similar circumstances. Again, with alternating currents, the number of alternations per second

is of the greatest importance in determining the dangerousness of the current. Ordinary alternating currents and the very similar polyphase currents so widely employed commercially alternate from, say, 25 to 300 times a second, and, other things being equal, are three or four times as dangerous to life as direct or continuous currents. But increase in the frequency of the alternations per second brings about a great diminution in the dangerousness of such currents, because it lessens their tendency to produce fibrillation of the muscle of the heart. Thus, at 350 alternations per second, alternating currents are no more dangerous than continuous currents, and at 1,720 alternations are about six times less dangerous, in the case of dogs. When the alternations are increased to tens or hundreds of thousands per second, as is the case in the so-called Tesla or high-frequency currents, the danger to life is still further reduced.

(*e*) *The position of the electrodes* with regard to the heart and the central nervous system. The importance of this factor is enormous, and was perhaps never widely appreciated until it was emphasized by the work of Prevost and Battelli. Even now it seems to be neglected by d'Arsonval and by many other writers upon the subject of death by electricity. It may be illustrated by a single experiment. If the two electrodes are applied to the two hind legs of a dog, alternating currents of about 4 amperes at 1,200 volts are not fatal to the animal, because with this arrangement the amount of current passing through the heart is not enough to cause it to fibrillate. If the two electrodes are now shifted to the two fore-legs, alternating currents up to 270 milliamperes and below about 80 volts are not fatal, for the same reason. But if the electrodes are placed on either side of the thorax, so as to concentrate the current on the heart, death is produced by alternating currents at only 15 volts pressure and a strength of about 50 milliamperes. Yet the resistance between the two electrodes is much the same—about 300 ohms—in each of the three cases. To me it does not seem possible to imagine a better demonstration than this of the importance of the current-density through the heart, or, to put the matter more definitely, the number of milliamperes per square centimetre of cross-section through the heart at right angles to the direction in which the current flows, in determining the danger to life incurred by exposure to electric currents. One cannot believe that the shock to the dog's nervous system, to which alone d'Arsonval attributes such a death by electricity, was greater at 15 volts than at 80, or at 80 than 1,200 volts, in the three variations of the experiment described above.

(*f*) *The Resistance at the Electrodes.*—This extremely important factor is very variable in amount unless great care is taken. It is obvious that it should be reduced to the lowest practicable value in any experiments designed to bring out the dangers of industrial electric currents to life, and to ascertain the lowest voltages that may be fatal. To quote an example, Grange in 1884 failed to kill dogs by alternating currents at 825 volts pressure, simply because his electrodes were so ill applied that the dogs' resistances were about 80,000 ohms, so that only 10 milliamperes of current can have flowed through the animals, a quantity much below the lethal dose. Later experimenters have found that the more careful and rational application of the electrodes makes the dog's resistance, in circumstances otherwise similar, only 300 ohms or thereabouts. Cunningham cut this resistance down still further to about 77 ohms in one instance—an error in the opposite direction. His electrodes must have been so large as not to concentrate the current satisfactorily on the sensitive spot, the heart. The result was that continuous currents of 700 milliamperes or more, sent through the thorax from one side to the other, were not necessarily fatal to the dogs he employed, while Zacon and Prevost and Battelli found 200 or 300 milliamperes of continuous current to be fatal to the dog if suitable electrodes were applied. Crile and Macleod observed resistances of about 1,000 ohms in their experiments on dogs.

Death by Electric Currents in Man.

We are now in a position to summarize what is known and what may be inferred as regards the killing of human beings by electric currents. This may conveniently be done on lines similar to those adopted above in the case of animals. I must ask to be allowed some repetition here, in the hope of making an obscure business clearer; for the literature of the subject makes it plain that the various factors controlling the results of electric accidents in man are by no means generally appreciated at their proper value or understood.

I. It is often assumed that different persons are differently vulnerable by electricity, and that in identical circumstances shocks that would be fatal to some would not be fatal to others. This is certainly true of the lower animals—for example, Battelli found an alternating current of ten volts fatal to one dog, but not to two others which were killed at 15 volts. It is probably true of man, but experiments to prove the point are naturally lacking, and it is not possible to prove or disprove it by the evidence of fatal or non-fatal electric accidents, because there are so many variable factors that determine the result in these besides that of idiosyncrasy. In other words, one is not justified in concluding that it is idiosyncrasy that has protected a person "A" from death by electric shock that has proved fatal in apparently similar conditions to another person "B," unless one is able to prove that all the other conditions really were identical; and that, practically speaking, can never be done. There are three other factors that have been emphasized as important in determining the result in electric accidents, and those are *fright*, *general anaesthesia*, and *sleep*. Much stress is laid on *fright* by d'Arsonval, who says that sudden physical surprise often has disastrous results for the vital functions, so that a shock that is unexpected may be fatal, but not fatal if it is expected. H even attributes the comparative failure of the methods employed in the electrocution of criminals in America to the fact that surprise at the moment of shock is lacking in this operation. Jellinek has recorded a case in which a man died of fright alone, having come into contact with a conductor which he believed to be carrying a current at high potential, but actually was not electrified at all. Great importance is attached by d'Arsonval to the *status somaticus et psychicus*, the state of body and mind, of anybody exposed to and receiving an electric shock; Aspinall supposes that persons of weak intellect can stand stronger currents than normal persons. This, again, is a matter that can only be determined by experiments made in definitely known conditions, and none such have been made; there is no evidence that fright increases the liability of the lower animals to death by electric currents. It is said that persons under the influence of *general anaesthetics* are able to survive exposure to currents that would be fatal were they conscious; several experimenters have found that general anaesthetics do not afford protection in this way to the lower animals, though Jellinek says that they do—much probably depends upon the depth of the anaesthesia obtained. As regards *sleep*, this also is generally believed to protect life against electric currents that would be fatal during waking hours; in modern literature one often sees quoted the case of a man who was severely burnt but not killed by contact during sleep with a conductor carrying a current at 5,000 volts, recorded by Aspinall. Here again there is need of further evidence. The analogous idea that sleep protects against death by lightning stroke is at least as widely spread, and dates from the time of Seneca.

In the vast majority of cases death by electric currents is due to accident; but in Italy both suicide and murder by electricity have been attempted, the former with success (Jellinek).

II. The death of human beings may be brought about by electric currents in several different ways.

(*a*) There is no doubt that it might be due to prolonged tetanus of the muscles, which could prevent the performance of respiratory movements, and so lead to death by asphyxia after some minutes. But I am not able to find that it ever has come about in this way as a matter of fact, the victim always being able either to break the contact and interrupt the passage of the current for himself, or to call for help and get the contact broken by somebody else before asphyxia has occurred in this way.

(*b*) In man primary heart failure is undoubtedly the commonest mode of death by electric currents. The experiments on animals already detailed show that such deaths are due to fibrillation of the ventricles of the heart. This fibrillation has been seen occurring in the hearts of two criminals electrocuted in America and examined immediately after death (Schumacher); a few minutes later the left ventricle was firmly contracted and empty, while the right ventricle and the auricles were relaxed in diastole and full of blood. It is probable that in the adult man, as in the dog, horse, and ape, fibrillation of the heart, once it is established, is irremediable, practically speaking.

(*c*) and (*d*). Death by failure of the respiration while the heart continues to beat, brought about by nervous inhibition, or by failure of both heart and respiration together, is probably not so common in man. There is a great want of evidence on this point; naturally enough, as the people who are present at deaths by electric shock are generally workmen who do not busy themselves with observations of the pulse and the respiration of the victim. A good many cases have been recorded in which death did not occur until ten, twenty, or forty minutes after the shock had been received, and was then apparently due to failure of the respiration to re-establish itself. The experiments upon animals would lead one to believe that such deaths are really due to failure of the respiratory centre in the central nervous system. The *post-mortem* evidence in such cases should suggest death by asphyxia, and such evidence has sometimes been found after death by electric shock.

(*e*) Brief reference may be made to the fact that a good many cases have been recorded in which the victim of an electric accident has died after a few days or weeks from complications (shock, gangrene, suppuration, exhaustion following extensive amputations) arising out of the injuries caused by the electric current. Mills and Weisenburg have recorded fatal cases of bulbar and bulbo-spinal paralysis, apparently due to electric shock.

III. Severe nervous shock, with or without some more definite lesion such as the paralysis of a limb or a paraplegia, is not rare in industrial electric accidents, and makes permanent invalids of a number of persons who survive the shock. Brief loss of consciousness is common in non-fatal cases of electric shock, and may be followed by an appearance of intoxication or even by mania—a fact that finds no parallel in the experiments done on the lower animals; just as in the lower animals attacks of convulsions are often determined by non-fatal shocks, but do not seem to occur in man (Battelli, Robinovitch).

Opinions as to the importance of nervous shock in fatal electric accidents are divided into two groups. On the one hand, Battelli and a number of writers believe that it is a transient affair, functional in nature, not important. On the other hand, d'Arsonval holds that it is by nervous shock alone that electric currents produce sudden or rapid death, by a sudden affection of all the vital functions. Jellinek goes further, and is more definite, setting down sudden death by electricity to a local trauma of the cells in the central nervous system, caused by what he calls a dynamogenic working of the electric current that may be compared to the local trauma of the nerve cells met with in the commotio cerebri of direct or indirect violence. He brings forward the elaborate details of his histological researches to prove that these minute lesions of the nerve cells and other tissues are to be met with in men and animals killed or injured by electric currents; but, as Schumacher points out, the cell changes and small haemorrhages found by Jellinek are in no way specially characteristic of death by electricity. It must be remembered that, as a rule, large amounts of electric energy and long periods of exposure to the passage of the current have been employed in cases in which marked changes have been found in the central nervous system after death; whereas in the majority of fatal accidents by electric shock as they actually occur, only a small current has passed through the victim and only for a short time, while none of it has had occasion to travel by way of the central nervous system.

IV. All the electrical and physical details of the circumstances in which electric currents pass through the body are of the greatest importance in determining whether the result will be fatal to a human being or not. For the sake of clearness they are best discussed under six heads.

(*a*) *Voltage of the Current.*—With alternating currents, death has occurred from shocks at voltages as low as 65 volts, and a good many instances of death at such pressures as 100 to 120 volts have been recorded. It is only in very exceptional circumstances that these low voltages can cause death; unless the patient's skin is wet and he makes a good contact not only with the electric conductor, but also through wet boots or clothes (according as he is standing or sitting) with the ground or some other conductor, there is not the smallest chance of death by currents at such low voltages. As the voltage rises so does the ease with which a fatal amount of current may be forced through the victim increase, and so it is that the large majority of deaths by electric currents are brought about by the alternating currents at much higher pressures—say 500 to 5,000 volts—that are in common industrial use. But here comes in a paradox. It would appear that *if good contact is made* currents at very high voltages become less dangerous to man, just as we have seen that they do to animals, and probably for the same reason—that large currents passing through the body do not happen to throw the heart into irremediable fibrillary contractions. Thus a number of instances have been recorded in which men have received industrial currents at 10,000 volts without being killed at once, although making good and prolonged contacts in such a way that large currents, too large to be fatal, one may say, must have streamed through the chest and heart. A very good example of this was recorded by Mr. Clement Lucas; others have been reported in France and Monte Carlo.[54] But if the victim makes a bad contact, or a contact of high resistance, either with the conductor at high voltage or with the ground, then the amount of current diverted through him may be small enough to kill him by cardiac fibrillation.

One often hears the question asked: What voltage is dangerous to life? No simple answer can be given to this question; the degree of danger depends on so many factors besides that of the voltage of the current from which danger is apprehended. As regards continuous currents of electricity, I have not found records of many fatal accidents at voltages below 220 volts, but in one case a direct current at only 95 volts caused death, in another a current at 110 volts.[55]

(*b*) *The Amperage of the Current.*—All the industrial electric currents met with in daily life, the currents used for lighting, heating, cooking, driving machinery of all sorts, have ample intensity (measured in amperes) to cause death if applied to the human body under favourable conditions. The only sources of electricity that might be expected to kill, but fail to do so for want of sufficient amperage, or rather milliamperage, are the induction coils used by *x*-ray specialists and others.

As regards the minimum number of milliamperes required to kill a human being under conditions favourable for killing there is no certain knowledge. Weiss calculates that from 70 to 90 milliamperes of an ordinary alternating current would be enough if the current went through the chest and heart; d'Arsonval states that much less than 100 milliamperes suffice to kill. One can make a rough calculation in some of the fatal accidents that have occurred; a number of persons have been killed by alternating currents at about 110 volts, passing from one hand to the other or from the hands to the feet, and experiments show that the resistance of the human body from hand to hand or from the hands to the feet may be from about 1,000 to 1,500 ohms, when the skin of both hands and feet is wet, so that one may guess the fatal current to have been from about 70 to 110 milliamperes in these instances. The experiments of Dixon Mann showed that alternating currents of from 15 to 30 milliamperes sent through the chest do not upset the heart's action; and Trotter found that continuous currents up to 35 milliamperes, though almost insupportably painful, were not fatal when passing from the hands to the feet.

When very large industrial currents are forced through the body by high voltages, we meet again with the paradox that, while small currents may kill instantaneously, large currents are much less fatal. For example, the American electrocutions have shown that currents of 5 or 8 amperes may pass for many seconds through the body without causing permanent arrest of the heart or respiration. In the non-fatal cases of shock by currents at 10,000 volts, of which I spoke a few minutes ago, it is true that no measurements of the amperes passing through the victims were made, but it is reasonable to suppose that they may have amounted to several amperes. It is plain, then, that currents of a fraction of an ampere may cause sudden death by throwing the ventricles of the heart into fibrillary contraction, though much larger currents of several amperes do not act thus and so are not fatal. But I do not know of any examples or experiments to show at what point or amperage the transition from small dangerous to large non-dangerous currents takes place.

(*c*) *Duration of the Current.*—The animals experiments showed that this is a factor of great importance in determining death or survival. And so, probably, it is in human beings; but its importance could only be determined by a series of comparative experiments under known conditions, and these are for obvious reasons not likely to be made. The fact that electric currents produce muscular tetanus, and often cause the victim to grip firmly any conductor from which he may be receiving a current of electricity, tends to make contacts of long duration; for example, Mr. Clement Lucas's patient clutched his 10,000 volt cable for thirty seconds before he was rescued.

(*d*) *Industrial alternating currents* are, other things being equal, more dangerous than *continuous currents*. So far as one can guess, in the absence of any experimental proof, it seems that a continuous current must be two or three times as strong as an alternating current, to kill a human being. In cases that are not immediately fatal it seems that the after-effects are more serious with continuous currents, no doubt because these electrolyse the tissues through which they pass, and thus leave behind them chemical and physical traces of their passage; whereas alternating currents naturally effect little permanent electrolysis or polarization in the tissues through which they travel.

(*e*) *The position of the electrodes*, or the points at which the current enters and leaves the body, are of great importance, as has been emphasized by Aspinall among others. For all practical purposes the heart is the danger point in persons making accidental contacts with conductors carrying electric currents. For it rarely happens that contact is made by the head, so that current has the opportunity to pass through the central nervous system (cases recorded by Zwaluwenberg, Zacon), and even then it is more than probable that death, if it does occur, is due to cardiac paralysis, and not to inhibition or action on the consciousness or psychical functions. Hence it is safe to say that, so far as sudden death is concerned, electric currents are dangerous to man in proportion to the degree to which they tend to pass through the heart. Thus a current travelling from one hand or arm to the other, or from a hand to the feet, or from the neck or the top of the trunk to the feet (as in a case recently described to me by Dr. R. S. Trevor) is highly dangerous; similarly, currents going through the left side of the body are commonly supposed by electricians to be more dangerous to life than those on the right side. But currents entering by one foot or leg and leaving by the other are, practically speaking, free from the danger of sudden death, because the strength (in milliamperes) of the current that flows through the heart under these conditions is necessarily far below the lethal minimum, however strong the current passing through the lower part of the body may be. For this reason, if one has to rescue the victim of an electric accident while he is still exposed to the current, it is advisable to try and draw or push him away with one's feet rather than with one's hands, unless one can be sure that one's hands are well insulated from the victim by dry clothes, etc. The desire to protect the cardiac region against the passage of electric currents has led to several brilliant but not practical suggestions that persons exposed to accidental electric shocks should wear garments woven of copper wire. Such a copper undergarment, closely applied to the skin of the upper and lower parts of the trunk, but insulated by a belt of indiarubber from the middle zone in which lies the heart, would divert the bulk of any current from that region, it is said,[11] and so save life.

(*f*) *The resistance at the electrodes*, at the points where the current enters and leaves the body, is a factor of the very greatest importance. This is best illustrated by a few actual examples:

A man in a factory stood barefooted in a mixture of sugar and potash, and with his hand touched a bare conductor carrying a continuous current at 95 volts, and was killed on the spot (Jellinek); the resistance between his hand and his feet, between the ground and the conductor, that is to say, cannot have been more than perhaps a few hundred ohms in these conditions. Had his hand or his feet been dry he could have handled the conductor with impunity, even without discomfort.

Zwaluwenberg details the case of a carpenter at work in an attic 4 ft. high at a temperature of about 100° F.; he was in a state of extreme perspiration, and kneeling on a well-earthed gaspipe, when his head came into contact with a cable carrying a 50-cycle alternating current at 100 to 110 volts, at a point where the insulation was worn away. The man made an outcry, was rescued in a few minutes, was seen to gasp several times, but died at once in spite of artificial respiration and traction of the tongue. In this case also the skin at the points of contact, the head and knees, was soaking wet, and so the resistance at the electrodes was reduced to so low a point as to permit the passage of a current strong enough to throw the heart into a state of fibrillary contraction and cause death. Had the man's skin been dry, or had he not been kneeling on a good conductor, he would not have lost his life.

Many other instances might be quoted to show the great danger of wetness to the skin or of the feet and boots, conditions that are inevitable among operatives and labourers of all sorts when there is risk of contact with conductors carrying electric currents at even these low voltages. There have been fatal accidents in domestic and in public bath-rooms even, when persons in baths or standing barefoot on wet floors have laid wet hands on electric lamps or bare wires that chanced to be directly connected with electric light mains carrying currents at a couple of hundred volts or so.

But with these electrodes, the hands and feet, in their more normal condition of dryness, the case is quite different; the danger to life is *nil*. The resistance of the human skin to the passage of electric currents is relatively great, and the skin is by far the most resistant of the tissues of the human body. Thus, Trotter quotes many experiences with himself and other people, showing that when the hands and feet are dry, conductors carrying continuous currents at 500 volts may be handled freely with impunity, for the normal resistance of the dry skin at the electrodes (the hands and feet) and of the boots is so great as to permit only a few milliamperes to pass through the body to the ground. When he was wearing old boots worn into holes and thoroughly wetted by walking in muddy streets and grasped the 500-volt conductor for three seconds, only 35 milliamperes of current passed through him; his resistance from boot to boot was reduced to 13,000 ohms, in place of the normal 45,000 to 200,000 ohms with ordinary boots that were not wet. One often reads accounts of people who have touched live conductors with high voltages without suffering material injury; in the great majority of such cases their immunity has been due to the high resistance presented to the current at the points where it had to enter and leave the body. The effect of the resistance at the electrodes and in the body in determining the result of electric accidents is shown schematically in the following table, in which it

Total Resistance of Body assumed to be:	Result of Brief Exposure to Passage of Alternating Current at a Pressure of:		
	100 volts.	1,000 volts.	10,000 volts.
Very low, with good contacts, 1,000 ohms	Certain death, slight burns	Probably death, marked burns	Survival, burns and other sequelæ very severe.
Higher, about 10,000 ohms	Painful shock, but no injury	Certain death, burns probably slight	Probably death, severe burns.
High, with bad contacts, 100,000 ohms	Scarcely felt	Painful shock, but no severe injury	Certain death, burns slight if resistance remains high.

is assumed that the current traverses the thorax on its way through the body.

Prognosis.

The prognosis in cases of severe electric shock has been very variously estimated. Cunningham (1899), for example, speaks of artificial respiration as "the only and almost invariably futile, method in vogue in electrical accidents at the present day," for the resuscitation of persons apparently killed by electric shock. The opposite view is held by Lauffer (1912), who says "there are few cases of electrical accident where the victim cannot be restored from the electrical shock, if appropriate immediate efforts at resuscitation are instituted" by performing artificial respiration with only a few seconds' delay. Jellinek (1905) is almost equally encouraging, stating that death by electric shock is in most cases only apparent death, and advocating immediate artificial respiration. This holds for cases of sudden death by electric currents; in the instances where death occurs many hours or days after the shock, it is caused by the burns or thromboses or other lesions due to the intensity of the current. There may be excellent general health after very extensive and severe electrical injuries; Weiss quotes the case of a man who was so badly burned by electricity that both legs and both forearms had to be amputated, yet he subsequently enjoyed good general health.

Treatment.

In spite of all the experimental work that has been done on the electrocution of the lower animals, the treatment of persons apparently killed by electric currents remains much where Priestley left it in 1767. He tried artificial respiration, and artificial respiration is still the most successful treatment available. It is best carried out by the prone pressure method of Schäfer, because it is the simplest and the least dangerous in the hands of the inexpert; by some authorities Sylvester's method, in which the victim is placed on his back and not on his stomach, is preferred (Brauchbar). The French generally recommend that rhythmical traction of the tongue should be performed at the same time, as was first recommended by Laborde (1894). This, however, could not be done easily with the patient in the prone position. Gibbons recommends the use of a special form of bellows. Atropine, recommended by Eggleston, has not proved of much service. The importance of getting to work with the artificial respiration without a moment's delay has often been emphasized by those who have had much experience of electrical accidents. No less important is the necessity for continuing artificial respiration until *it is certain* that death has occurred; nothing less than cooling of the body or the onset of rigor mortis should be considered to be evidence of death here.

Recovery after two hours of apparent death is mentioned by d'Arsonval (1910), who gives a first-rate account of the steps that should be taken in rescuing and resuscitating the victims of electric shocks. It must be remembered that the great majority of electrical accidents take place in workshops and other places where immediate skilled assistance is very rarely available, so that any but the simplest of treatments could not, practically speaking, be employed.

It is worth while to mention two other possible methods of treatment. It has been seen that in most cases death by electric shock is due to cardiac failure, the heart being thrown into fibrillary contraction. Prevost and Battelli, and others after them, have shown that the fibrillating hearts of the lower animals can be made to beat regularly and rhythmically once more by passing strong electric currents through them within a given time—a few minutes; so that the apparently dead animal is brought to life again. It is more than probable that the same treatment—a hair of the dog that bit them—could be applied with success to human beings apparently killed by electric currents, but there are two practical difficulties here. In the first place there is no experimental evidence, in the case of man, to show what voltage and what strength of current should best be employed in this method of resuscitation. In the second place, there would usually be great difficulty in providing the current at the required voltage for use on the spot and within a few minutes. Still, this method is well worth further investigation and trial. The second mode of treatment I wish to mention is that tried, though without success, by Stanton and Krida. These authors started out from the work of Crile and Dolly on the resuscitation of animals killed by chloroform and by asphyxia, which showed that recovery after apparent death was possible if the pressure in the coronary arteries could be raised sufficiently, by the arterial injection of salt-solution and adrenalin, to restore some sort of circulation through the substance of the heart. If this was done mechanical stimulation of the heart through the chest wall would then cause it to beat vigorously again, and the animal seemingly killed by chloroform or asphyxia, as the case might be, would be brought back to life. Stanton and Krida tried this method of resuscitation on dogs subjected to the ventricular fibrillation caused by electric currents of low voltage, but it did not prove successful.

NOTE.—A list of references to the literature will be given at the end of the third lecture.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

SODIUM CARBONATE IN RINGWORM.

THE following method was shown me by a conscientious but rather ignorant woman who has had charge for many years of a home for waifs and strays. She said that she had never known more than two applications necessary. Take a piece of sodium carbonate (the household washing soda) about the size of a walnut, and hold it against red hot iron (I use the poker heated in the consulting-room fire); then rub the melted end freely into the ringworm, and particularly thoroughly if it is in the scalp, which must have had the hair round cut short. One application is sufficient on the body, but on the scalp it may be necessary to repeat it six or seven days later. Usually no dressing is necessary, though if sore boric acid ointment may be used. This apparently heroic treatment is practically painless, leaves no permanent mark, and, so far, has not failed me.

Penkridge, Staffs. W. W. NOCK, M.R.C.S., L.R.C.P.

Reports

ON

MEDICAL AND SURGICAL PRACTICE IN HOSPITALS AND ASYLUMS.

COUNTESS OF DUFFERIN HOSPITAL, BARODA.

CONGENITAL ABSENCE OF RECTUM AND LARGE INTESTINE.

(By CLIFFORD MAYER, M.D., B.S.Lond., Chief Medical Officer, Baroda State.)

B. D., a Hindu female infant aged 3 days, was admitted on November 23rd, 1912, for intestinal obstruction. The history was that the child, soon after birth, had passed some meconium, and since then only a little mucus and blood. Castor oil had been given and glycerine enemata tried by a local practitioner with no effect. There had been vomiting since the day before.

On admission, the temperature was subnormal and the pulse hardly perceptible. The anal canal admitted the tip of the little finger. The abdomen was very distended, and on palpation a doughy, sausage-like mass on the right side was imperfectly made out. Intussusception was diagnosed. The child was infused. The pulse improved, and two hours after admission the abdomen was opened by an incision in the right rectus close to the middle line. On incising the peritoneum a blind end of much distended gut projected for about six inches. The bowel was relieved of its contents, a Paul's tube tied in, and the gut securely fixed to the abdominal opening.

The operation was well borne, and for the first four days progress was very satisfactory, the child taking its feeds very well. On the fourth day the Paul's tube came out, and on the fifth day a pemphigoid rash broke out on the

buttocks, and the stools became greenish. Ointment and hydrarg. c creta were prescribed. On the ninth day the bowel prolapsed during the night, and was replaced under chloroform by the house-surgeon. On the twelfth day there was again a slight prolapse of bowel, and the skin of the abdomen round the wound was raw. On the eighteenth day the stools had improved, the rash and soreness of the abdomen were much better, and the appetite good, but the child was much wasted. It never picked up again, began to vomit its feeds on the twenty-third day, and died on the twenty-fourth day.

On *post-mortem* examination it was found that the anal canal was patent for about an inch, but the rectum and the large intestine were represented by a white, thin, cord-like band in the whole of their course. There were a meso-sigmoid and transverse mesocolon, and a minute appendix near the caecal end. The blind end of the gut, which had been opened at the time of the operation, was quite free from mesenteric attachment for about 6 in., and belonged to the ileum.

It was evident that no meconium could possibly have been passed soon after birth as stated in the history, which with the passage of blood and mucus and the doughy feeling caused by the free sausage-like end of the blind ileum, had misled me, perhaps pardonably, into a diagnosis of intussusception.

British Medical Association.

CLINICAL AND SCIENTIFIC PROCEEDINGS.

EDINBURGH BRANCH.

CLINICAL MEETING.

THE winter clinical meeting of this Branch was held in the Royal Infirmary, Edinburgh, on Friday, February 21st, and was attended by about 100 members.

Museum.

The museum was exhibited in Ward 4, where a large number of specimens were shown from the surgical, gynaecological, and pathological departments of the university, as well as by individual members of the profession. Those who exhibited were Drs. Cranston Low, Comrie, Ford Robertson, Barbour, Spence, Edmund Price, and Eason, and Messrs. Caird, Stiles, Dowden, Beasly, Wilkie, Wade, Struthers, and Carmichael.

Demonstrations.

Demonstrations were given in the Lock department by Mr. SCOT-SKIRVING, in the skin department by Dr. NORMAN WALKER, and in the eye wards by Dr. GEORGE MACKAY. The therapeutic uses of radium were shown by Dr. DAWSON TURNER, and the modern methods of hydro-electro-therapeutics by Dr. WEBSTER.

Clinical Cases.

The clinical meeting was held in the large surgical theatre. Dr. JAMES CARMICHAEL, President, was in the chair, and a large number of cases of medical and surgical interest were shown by the members of the staffs of Chalmers Hospital, the Royal Hospital for Sick Children, and the Royal Infirmary.

Dinner.

An enjoyable dinner was attended by about thirty members in the Carlton Hotel. It was presided over by Dr. JAMES CARMICHAEL. The guests included Dr. Munro Moir (Inverness), Dr. Haig (Crieff), Dr. Crerar (Maryport), while amongst those present were Professor Alexis Thomson, Mr. Cathcart, Dr. George Mackay, Dr. Luke, Dr. Carlyle Johnston, and Dr. Hamilton (Hawick).

After the loyal toast had been responded to, the CHAIRMAN gave the toast of "The British Medical Association," and Dr. HAMILTON (member of Council) replied in a vigorous and rousing speech. The sentiment of prosperity to the Association was enthusiastically received. Mr. CATHCART proposed the toast of "The Guests," and welcomed those present. Dr. CRERAR (Maryport) and Dr. HAIG (Crieff) replied. Dr. HAMILTON made an innovation on the toast list in proposing the health of "The Senior Secretary," and in a complimentary speech alluded to and thanked him for his services during the past ten years on behalf of the Association. Dr. DEWAR replied. "The health of the President" was proposed by Mr. STRUTHERS; and that of "The Secretaries" by Dr. HAIG, to which the JUNIOR SECRETARY replied.

BURMA BRANCH.

A MEETING of the Burma Branch was held in the Civil Hospital, Maymyo, on January 24th. Colonel HEHIR, I.M.S., was in the chair, and there was a large attendance. The following cases were shown by Major HAMMOND, I.M.S.:

CASE I.—A case of tuberculous dactylitis cured after operation in which a Pott's curvature was developing. The curvature was very acute, and there was a posterior abscess.

CASE II.—A case showing a good result after a complete mastoid operation.

CASE III.—A case of unilateral exophthalmos. The eye was bulging forwards without pain, paralysis, loss of sight, or other symptoms. The cause and treatment were discussed.

CASE IV.—Recurrent epithelioma in the groin after excision of the penis and glands.

CASE V.—A case of puncture of the eyeball by a sewing needle. The puncture had healed, but the sight was lost, and the question of sympathetic ophthalmitis was discussed.

Colonel HEHIR, I.M.S., then commenced a paper on undiscovered points in malaria, which will be concluded at the next meeting.

Reports of Societies.

ROYAL SOCIETY.

Thursday, February 20th, 1913.

Sir ARCHIBALD GEIKIE, K.C.B., President, in the Chair.

Rhythm arising from Rivalry between Antagonistic Reflexes.

PROFESSOR C. S. SHERRINGTON, F.R.S., read a paper on reflex stepping as the outcome of double reciprocal innervation, in continuation of work on the reciprocal innervation of symmetrical muscles recently communicated to the society. The observations were almost wholly upon the decerebrate preparation. The symmetrical muscles used in the experiments were the extensors of the right and left knee. Taking an afferent nerve which produced steady reflex excitation of the muscle, and another which produced steady reflex inhibition of the muscle, it was found possible by stimulating both nerves concurrently to obtain regularly rhythmic contractions and relaxations of the two muscles, the rhythm being about 2 per second. To do this required certain somewhat narrowly adjusted proportions of strength of the two paired stimuli. The stimuli were both of them continuous, in the sense that they were faradic, and of a frequency (about 40 per second) much above and bearing no causal relation to the rhythmic reflex produced. In the rhythmic reflex the right and left muscles each contracted and relaxed alternately and moved reciprocally, the contracting phase of the right muscle being synchronous with the relaxing phase of the left, and conversely. This rhythmic reflex was shown clearly to be reflex stepping. In short, under the equipoise of the two opposed and, so to say, equiposed continuous stimulations, the limbs exhibited reflex walking. With certain other paired intensities of stimulation of the two antagonistic afferent nerves, it could be arranged that only one muscle of the pair stepped—the left muscle if the right nerve stimulus were the stronger, and conversely. In this unilateral walking or running the other leg was kept steadily flexed by the reflex, that is, the extensor muscles were kept steadily inhibited.

The Synthesis of Protoplasm.

DRS. W. CRAMER and J. LOCHHEAD, in a continuation of previous contributions to the biochemistry of growth, showed that glycogen disappeared more rapidly from the liver of tumour-bearing rats than from the liver of a normal rat. Since observations on the gaseous metabolism showed that there was no increased oxidation of carbohydrate material in tumour-bearing animals, the results confirmed the conclusion arrived at previously from observations on pregnant animals, that in growth carbohydrate material is used for the synthesis of protoplasm.

ROYAL SOCIETY OF MEDICINE.

MEDICAL SECTION.

Tuesday, February 25th, 1913.

DR. FREDERICK TAYLOR, President, in the Chair.

The Prognostic Significance of Secondary Polycythaemia in Cardio-pulmonary Cases.

DR. F. PARKES WEBER, in a paper on this subject, said the frequent occurrence of polycythaemia in those cases of congenital heart disease, especially congenital pulmonary stenosis, which were associated with some cyanosis, was well known. A few such patients reached adult life, as in two cases which he had exhibited, whose blood changes he had investigated. They seemed to support the modern doctrine that the excess in the number of red corpuscles was of a conservative or compensatory nature, an attempt on the part of the bone marrow to make up for imperfect oxygenation of the blood and tissues of the body by a numerical increase of the red cells. But the figures obtained by blood counts might lead to an underestimation of the total numerical excess of erythrocytes in the body, because the total volume of blood in the body was likewise excessive. In one case the same conclusion was indicated by an estimation of the total haemoglobin and the total blood volume in the body by Haldane and Lorrain Smith's carbon monoxide method. The secondary polycythaemia in cases of congenital heart disease was seldom rivalled in degree by the secondary polycythaemia which sometimes occurred in chronic valvular affections and in cases where there was adherent pericardium. It was more nearly approached by the secondary polycythaemia sometimes found in the late stages of pulmonary emphysema, chronic bronchitis, asthma, old bilateral pleuritic adhesion, chronic interstitial pneumonia, and pulmonary fibrosis. In the cardio-pulmonary cases he regarded the outlook as very grave at the stage when cyanosis and a great degree of polycythaemia became striking clinically. Dr. Weber proceeded to describe a typical attack, during which the red blood cells were 7 millions or more. With increasing cyanosis and chronic carbonic acid poisoning there was often marked somnolence, which might proceed to actual coma, and death might be directly due to carbonic acid poisoning or to intercurrent bronchopneumonia. An important etiological factor seemed to have been the abuse of alcoholic drinks. Some of the cases improved, at all events temporarily, under prolonged rest in bed, small doses of potassium iodide, cardiac stimulants, diuretics and expectorants, oxygen inhalation, and perhaps also moderate blood-letting. The bone marrow was examined in one case, and showed a decided erythroblastic reaction. Dr. Weber concluded by relating eleven illustrative cases.

Some Cases of Polycythaemia.

Dr. GORDON R. WARD said it was customary to divide these cases into (*a*) relative, (*b*) absolute. The first included those in which there was a concentration of the blood due to excessive loss of fluid from the body, as in cholera, the rapid formation of pleural or other effusions, excessive perspiration, etc. But the absolute form was distinguished by the presence of an actual increase of red cells above the normal number for the whole body. This class included erythremia, the polycythaemia so frequently associated with congenital heart disease, and that of acquired lung disease. The absolute class would show signs of increased formation of red cells, such signs including increase of red marrow, dilatation of vessels due to the compensatory hydraemia following increased viscosity of the blood, the presence in the circulation of immature red cells, and the otherwise inexplicable hypertrophy of the left ventricle. Yet it was not always easy to differentiate the two classes. For example, one man had acute heart failure; when first seen, his red cell count was 7 millions, but in four days they had fallen to just half that quantity as the cardiac condition improved. This would appear to be a simple case of concentration, yet here was irrefutable evidence of rapid new red cell formation in the shape of a blood crisis. If the case had not recovered from the heart failure, there would have arisen a compensatory polycythaemia in addition, and this would have been permanent—in fact, an absolute polycythaemia. He found it quite impossible to group into absolute and relative the 24 cases he was narrating in this paper; therefore he had recourse to a classification which was partly etiological and in part purely clinical. The first group he called congenital polycythaemia, and all the cases in it were associated with cyanosis, and probably all had clubbing of the fingers. It was a congenital abnormality presumably in the nature of deficient development. Next came the first idiopathic group—cases of possible erythremia, and one case was probably unique in that it was hereditary. The second idiopathic group consisted of cases which showed sparseness of subcutaneous fat, a polycythaemia reaching 7 millions, and a brick-red complexion and dry skin. Blood pressure was much above the normal. The cases in the third idiopathic group all had polycythaemia with excess of subcutaneous tissue, and a generally fat and unhealthy appearance. His fifth group he called the compensatory, and the sixth the reactive. The compensatory polycythaemia followed a stimulus to which the only true reaction was true polycythaemia; but reactive polycythaemia was met with in cases in which there was no discoverable need for polycythaemia, though there was need for repair of a previously impoverished blood. It was, in other words, an excess when all that was really demanded was a return to the normal. Dr. Ward's new group was therapeutic polycythaemia, and these cases resembled the last, except that there was reason to suppose the nature of the stimulus causing the polycythaemia was known. Group eight were the mixed cases, and group nine those of doubtful causation.

The papers were briefly discussed by the PRESIDENT, Dr. R. HUTCHISON, Dr. BATTY SHAW, Dr. ELLIOTT, and Dr. PARKINSON; and the authors replied.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF OBSTETRICS.

Friday, February 7th, 1913.

MR. A. J. HORNE, F.R.C.P.I., President, in the Chair.

Two Cases of Rupture of the Uterus.

DR. MADILL read notes of these cases. In the first the patient was a 5-para, aged 34. After being in labour for seven hours a severe pain occurred, and no more ensued. Two hours later she was admitted into hospital. The fetus could easily be defined on palpation of the abdominal walls. Supravaginal hysterectomy was performed; all the fetus, except its head, lay free in the abdominal cavity, the rest lay on the left side of the uterus, in which organ the placenta lay loose. There was much free blood in the peritoneal cavity. The patient recovered. The abdomen was very pendulous. The second patient, a 6-para, aged 32, had intermittent pains for a fortnight; the forceps was applied without success, and then she was sent moribund into hospital. Abdominal section was performed; a hydrocephalic fetus, weighing 9½ lb., lay with the placenta free in the peritoneal cavity; there was an extensive laceration on the right side of the uterus, and the bladder was badly torn. Hysterectomy was performed, but the patient succumbed almost directly afterwards. Dr. JELLETT congratulated Dr. Madill on the success of his first operation; he himself had reported another, last session, which also succeeded. Dr. SOLOMONS related an instance of rupture of the uterus from neglected brow presentation; the body of the child escaped into the peritoneal cavity, but delivery was effected by forceps, the placenta removed manually, and the rent plugged with iodoform gauze. The patient recovered. Dr. PUREFOY, who had assisted at both Dr. Madill's operations, said that no hard and fast rules for diagnosis and treatment could be laid down. Rupture occurred sometimes without any of the usual signs.

Wertheim's Hysterectomy.

Dr. E. H. TWEEDY exhibited a cancerous uterus removed from a woman aged 38. There had been haemorrhages, one causing syncope, and she believed herself to be a bleeder; she was plugged, and then sent into hospital. The entire lip of the cervix was involved, but the uterus was mobile, and there was no cachexia. When the uterus was removed, a small myoma was discovered in its cavity.

surrounded by clot; had it not caused the haemorrhage, the patient would not have applied for relief till later. As it was, glands were discovered far from the original growth. Dr. PUREFOY questioned whether a uterus the seat of a fibromyoma was specially liable to become cancerous. Malignant disease of the cervix soon extended to distant glands.

Surgical Treatment of Septic Pelvic Thrombosis.

Dr. JELLETT, in a communication on pelvic thrombosis, referred to a case of pyaemia in the Rotunda Hospital, with thrombosis of the ovarian vein, as detected at the necropsy, and he decided, in considering that case, to operate in future. He recorded three cases, in all of which the first symptoms were recurrent rigors, high temperature, and rapid pulse. He preferred abdominal section in the first case, removing with perfect success a large thrombosed and suppurating vein. In the second, where he operated much later—namely, on the thirty-ninth day—he removed a thrombosed ovarian artery and vein; a few rigors followed, yet the patient recovered. The third was similar to the first, but the whole of the ovarian vein contained pus and there were two abscesses in its vicinity. The patient improved for a few days, then grew worse, and on the thirtieth day after labour a second operation was undertaken in order to tie the internal iliac vein, which he suspected to be thrombosed. It was not plugged, however, but there was apparently thrombosis and suppuration of the uterine vessels. Hysterectomy was performed, but the patient died on the thirty-fourth day with symptoms of pulmonary sepsis. In all three subjects thrombosis developed on the right side and primarily in the ovarian vein, favourably placed for operation. Early surgical interference was always advisable. The early symptoms and the thickening or swelling of the broad ligaments, with relatively little pain or tenderness, were diagnostic. Professor SMITH noted that the opinion among operators experienced in the surgery of pelvic thrombosis seemed to lay more stress on conditions detected bimanually than on high temperature and relatively slow pulse. If infection spread from the placental site it was possibly carried through the ovarian vein. Professor Smith agreed with Taylor of Birmingham as to choice of operation by the vaginal route in suitable cases. Dr. SHEILL suggested that the relative frequency of infection on the right side was attributable to the fact that most doctors were right-handed, the examining finger being passed along the right side of the genital tract. Possibly ulceration of the cervix might supply the infection. Mr. PEARSON held that the subject was suited for the Section of Surgery. With regard to the technique, before proceeding to follow up the veins, the ovarian vein should be exposed where it entered the vena cava or left renal vein, and divided. It was important to start as far away as possible from the focus of infection, as there was a great danger of embolism if the general circulation were not cut off before the septic parts were dealt with. Cases in which thrombosis existed were apparently more favourable than those where there was no clot in the vein. Vaccines were of little use in cases of acute infection, and it seemed irrational to give a vaccine in acute sepsis, but Mr. Pearson had seen benefit from serum in several cases. After-treatment was as important as operation. The patient should be saturated with as much liquid as possible to aid the kidneys in eliminating the toxins. Dr. ROWLETTE dwelt on the unsatisfactory results of vaccines in thrombosis in the United Kingdom, whilst in America the cases of sepsis where there was thrombosis did best. In nearly every case of thrombosis in this country there was mixed infection—hence, perhaps, the unsatisfactory results of vaccines. Dr. Rowlette had successfully employed vaccine in two cases. In the first there was acute puerperal melancholia with pyaemia, and an autogenous *Staphylococcus aureus* vaccine was administered. In the second there was not only thrombosis, but also infarcts in the lungs, and the patient was very ill. It was thought that she could not bear an anaesthetic, still less an operation. A growth of streptococci was obtained from the venous blood and a vaccine prepared. The temperature and pulse came down step by step and the general condition improved. In a week the patient was convalescent, and, though an attack of pleurisy supervened, she recovered completely. It was one of the worst cases of puerperal sepsis he had ever seen. Dr. PUREFOY considered that Dr. Jellett was correct in stating that 60 to 70 per cent. of septic thrombosis cases did not recover. Dr. JELLETT, in replying to the remarks, said he did not mean to suggest that no cases of pyaemia recovered, but when there was thrombosis of veins with suppuration the mortality must be something near 100 per cent. In cellulitis an infection first passed into the connective tissue—say, from a torn cervix. This started the cellulitis, and thrombosis in the veins might or might not follow. In septic thrombosis, on the other hand, the infection passed straight into the open veins from the placental site. It had been questioned whether it were better to attack the thrombosed ovarian vein from below or from above. In the majority of cases the transperitoneal operation was the better. He was indebted to Mr. Pearson for his remarks about the ligature on the upper part of the ovarian vein. Dr. Sheill's suggestion might account for infection of the vaginal mucous membrane, but not for infection of the placental site. He recognized that the question of operation in these cases was still a very grave matter, but that in cases such as those he brought forward it was positively indicated.

SECTION OF ANATOMY AND PHYSIOLOGY.

Friday, January 24th, 1913.

Dr. B. J. COLLINGWOOD, President, in the Chair.

The Adequate Stimuli of the Respiratory Centre.

PROFESSOR T. H. MILROY described the methods of studying the influence of nervous factors in the production of apnoea, and also the effects of various gas mixtures on the quiescent centre. The following conclusions were tabulated: (1) Alterations in the rate or degree of distension of the pulmonary alveoli when the amount of ventilation is constant do not affect the duration of the apnoeic pause in any constant direction, but a repetition of ventilation periods tends to prolong the pause. (2) Removal of the vagal control does not interfere with the production of the apnoeic pause. (3) Any rise in the CO_2 content of the air used for ventilation shortens the apnoeic pause, and any increase in the carbonic acid content of the gas mixture used to distend the lung after pulmonary ventilation with air shortens the period. With increased CO_2 content of these gas mixtures irrespective of the amount of oxygen, the apnoeic pause proportionately decreases. (4) Injection of small quantities of acid solutions directly into the carotid during the pause leads to respiratory movements of an exaggerated type, as does also injection into the central end of the carotid and into the external jugular vein to a lesser degree. (5) With the excitation of such respirations during the pause there is associated an increased passage of carbonic acid from pulmonary blood to air. (6) These effects are produced after removal of the vagal control, but the excitability of the centre under such conditions seems to be diminished. (7) The passage of CO_2 from alveolar gas mixtures to blood, or from blood to alveoli, seems to depend entirely upon the difference of the pressure of that gas in the blood and air in the alveoli. (8) It seems most probable that the effective stimulus of the respiratory centre rendered quiescent by over-ventilation is a rise in the carbonic acid concentration in that centre, whether brought about by the normal rise in carbonic acid formation during the pause, with its associated rise in the CH_1, or primarily to a rise in the CH_1 from the formation of acid products of incomplete oxidation giving rise secondarily to an increase of the free CO_2 tension. Professor W. H. THOMPSON, Dr. O'CONNOR, and the PRESIDENT spoke; and Professor MILROY replied.

Thrombin and Antithrombin.

Mr. M. T. M'MAHON gave a demonstration of the action of thrombin and antithrombin. The PRESIDENT pointed out that this preparation of thrombin acted equally well in purpura haemorrhagica and in haemophilia. Mr. SHERIDAN had used this preparation with success for persistent bleeding after extraction of teeth.

Creatinin and Urea.

Professor W. H. THOMPSON described some new standard solutions for the estimation of creatinin by Folin's method, and also described a modification of Benedict's method for estimating urea. The PRESIDENT and Professor MILROY spoke, and Professor THOMPSON replied.

OXFORD MEDICAL SOCIETY.

A MEETING was held in the Radcliffe Infirmary on Friday, February 14th, the President (Dr. W. DUIGAN) in the chair. Mr. A. P. DODDS-PARKER showed the following series of cases of fracture treated by modern methods: (1) Fracture of upper end of humerus in a young man, treated by a Lane's plate; perfect union. (2) Fracture of olecranon in a woman, treated by wiring; very good result. (3) Fracture of olecranon in a man, treated by wiring; very good result. (4) Fractured femur in a boy, treated by a Hodgen's splint; perfect union, no shortening. (5) Fractured tibia in a man, treated by a Lane plate; there was delayed union and much callus, but a good result. (6) Fractured humerus of the middle third in a man, treated by a Lane plate with a good result. (7) Fractured tibia and fibula in a man, treated by a Lane plate for non-union; good result. (8) Fractured patella in a man, treated by a wire and a Lane plate; good position of the patella and walks well. (9) Fractured ulna and radius in a man, treated by a Lane plate with a good result. All the cases were illustrated by *x*-ray photographs before and after, taken and demonstrated by Mr. R. H. SANKEY. Dr. W. TURRELL then showed a case of *Lupus of the cheek* in a woman who had had no treatment for twelve years, whom he was in process of treating by diathermy. Five applications had been given, and the effects of various intensities of the treatment were demonstrated in a piece of fresh liver tissue. Dr. W. COLLIER related the histories of two unusual cases of *Diphtheria*, the first in a woman, aged 28, who was admitted into the Radcliffe Infirmary for chorea of pregnancy. The patient became maniacal, and as the child was viable labour was induced. A parotid abscess developed in which staphylococci were found. Later, six weeks after her entry into hospital, her voice became husky, there was respiratory stridor, and she died. At the *post-mortem* examination a diphtheritic membrane, in which *B. diphtheriae* was found, extended from the vocal cords to below the bifurcation of the trachea. The second instance was that of a nurse who had been in attendance on a very bad case of septicaemia of doubtful nature. The nurse subsequent to leaving her patient developed a high temperature, great cyanosis, and rapid failure of strength. There were a few râles in the chest, and *B. diphtheriae* with numerous cocci were found in the sputum, but none of the ordinary clinical signs of diphtheria were present. Antidiphtheritic serum had no effect. At the *post-mortem* examination diphtheria bacilli were detected in the mucus of the trachea and smaller bronchioles. The lungs were oedematous and partly solid, but did not sink in water, and no other lesions were discovered.

BRISTOL MEDICO-CHIRURGICAL SOCIETY.

AT a meeting on February 12th, Dr. WALTER SWAYNE, President, in the chair, a discussion was held on the *Treatment of chronic constipation*. It was opened by Dr. F. H. EDGEWORTH, who said that constipation might exist, although the bowels were opened daily. Delay in passage of the intestinal contents over the normal forty hours could be easily shown by the administration of charcoal biscuits to colour the faeces. Salines were particularly efficient in patients with high blood pressure. In order to retain its effects, cascara must be given in increasing doses, but with aloes the dose need not be increased. In cases combined with neuroses bromides were efficient, and when the chief difficulty was the emptying of the lower bowel enemata had to be given, glycerine being unsuitable for constant use owing to its injurious action on the mucous membrane. Mr. CARWARDINE had been able to cure several cases by the division of adhesions in the ileo-caecal region, but he was doubtful as to the advisability of performing such extensive operations as removal of the colon. Mr. F. G. BERGIN pointed out that by locating the situation in which delay occured a bismuth *x*-ray examination was of great help towards correct treatment. Dr. BERTRAM ROGERS regarded constipation in children and infants as the result of bad habits combined with a deficiency of fats in the food, and particularly of water. Dr. MICHELL CLARKE regarded neglect in children as the most frequent cause, and insisted on a routine rectal examination in cases of constipation. Mr. LANSDOWN had once been asked to remove the colon to cure a case of constipation, but had given relief by removal of enlarged ovaries impacted in the pelvis. Mr. FIRTH had treated a chronic case by appendicostomy and lavage, but had been compelled later to remove the colon.

LIVERPOOL MEDICAL INSTITUTION.

AT a meeting on February 20th, Mr. ROBERT JONES, President, in the chair, Mr. T. R. W. ARMOUR read a note on two cases of *Recurring dislocation of the shoulder* in which "Clermont's" operation had been performed by Mr. Robert Jones. The first patient had had his right shoulder dislocated seventy-six times and his left twenty-eight times. Capsulorrhaphy had been performed on both joints without success. The operation consisted in bringing a long flap of the posterior margin of the deltoid through the quadilateral space in front of the capsule of the joint and stitching its end in front under the coracoid process. This deepened the socket and tightened the capsule. Care was needed to avoid injury to the nerve and arterial supply of the muscle. In the first case the operation, performed in June, 1912, had not been a success. The second, done last November, had been so far quite satisfactory. The first had failed from faulty technique. The deltoid flap had not been long enough and the tunnel not wide enough to allow easy manipulation; nor had the fixation of the flap been sufficient to prevent it from returning to its original place. In the second case care had been taken in these points, and so far with good result. The operation was only on its trial. Mr. THURSTAN HOLLAND read a paper on *X-ray examination of the stomach*. Half to three-quarters of a pint of bread and milk, of the consistence of bread sauce, mixed with three or more ounces of bismuth carbonate, or barium sulphate, which was much less expensive, was given to a fasting patient. The stomach was then seen to be much longer and narrower than was depicted even in contemporary anatomical works. The lower end came to the level of the iliac crest, and the whole organ was to the left of the middle line. The movements were rhythmical at the rate of one in twenty seconds, and did not pass along to the duodenum. The food did not lie at the lowest part of the stomach, but was distributed through the length when full. The normal stomach emptied in about three and a half hours after this test meal. Mr. Holland showed lantern photographs of the normal stomach and its variations and contractions; also of three cases of transposed viscera; of cases where gastric enterostomy had been done; and of cases of gastroptosis. He demonstrated a photograph of dilated stomach where the lower end lay quite in the pelvis; also photographs of malignant disease and of hour-glass contractions of the organ. Dr. T. R. BRADSHAW said that Mr. Holland was recognized as an expert authority. The *x*-ray method afforded invaluable assistance in the diagnosis of very many cases. Dr. HILL ABRAM said that the physician would still be obliged, especially in places remote from elaborate equipment, to rely on the older methods of diagnosis. Dr. BRADLEY-HUGHES and Dr. R. J. M. BUCHANAN also spoke; and Mr. THURSTAN HOLLAND replied. Dr. EDGAR STEVENSON read a paper on *Some points in modern eye practice*. Cocaine hydrochlorate appeared to be the most useful of all local anaesthetics. A weak mydriatic, such as homatropine, was safer than the stronger preparations. Among silver preparations, the nitrate was the most useful. Subconjunctival injections of mercury oxychloride had been found of value in septic cases. Aspirin in trauma and in iritis cases, and sodium salicylate in large doses in sympathetic ophthalmia, were of service as internal remedies. Dr. Stevenson's experience of salvarsan, of vaccines, and serums had not been very favourable. Of physical remedies, Dr. Stevenson condemned

cold applications as dangerous, and found heat more useful. Depletion by leeches was highly beneficial. Two preparations illustrating Tote's operation for dacryocystitis were exhibited. Mr. T. H. BICKERTON objected to the use of silver nitrate in gonorrhoeal ophthalmia. For sixteen years he had never used that salt. He applied iced compresses, and had never lost an eye. Dr. W. T. CLEGG called attention to the omission of urotropin, which he had found useful in wounds of the eye. He did not think subconjunctival injections were better than ordinary subcutaneous injections. In the treatment of dacryocystitis he was satisfied with the older methods of treatment, and thought excision of the sac should be of very limited application. Mr. NIMMO WALKER agreed with Dr. Stevenson in the condemnation of the use of ice-pads in gonorrhoeal ophthalmia, and was convinced that warm moist applications were the best in the acute stage. He had not tried blood-letting in glaucoma. In routine examinations of the blood pressure in cases of chronic glaucoma he had failed to find any definite relationship between changes in circulatory and ocular tensions. In dacryocystitis slitting the canaliculi and probing were worse than useless. The new operation described by Dr. Stevenson was well worth trying. Mr. MALCOLM STOCKDALE agreed that the old-established drugs, such as cocaine, atropine, and boric acid, still retained their place in eye work. The use of silver nitrate solutions, he thought, should always be very limited. In gonorrhoeal ophthalmia the infection, being at first on the surface, could be washed away by a mild lotion, such as boric acid. In advanced lacrymal disease he had found excision of the sac to yield satisfactory results. Dr. HARCOURT and Dr. LOGAN also spoke; and Dr. STEVENSON replied.

LEEDS AND WEST RIDING MEDICO-CHIRURGICAL SOCIETY.

A MEETING of the society was held on February 28th, the President (Dr. DOBSON) in the chair. Dr. W. CUTHBERT MORTON read a paper on *The present crisis in anatomical nomenclature*. The Basel Nomenclature, which was promulgated by the German-speaking anatomists in 1895, had made such progress in America and the colonies, and even in the United Kingdom, that the Anatomical Society had been forced to discuss its adoption, not merely as an international code, but for ordinary use. There were grave objections to the new nomenclature, which did not claim to be more than a list of names, acceptable to German-speaking anatomists, submitted to anatomists speaking other languages. In spite of much that was excellent, the principles on which it was based were not scientific, and it did not sufficiently regard the needs of medicine and surgery. Moreover, in some respects it was not up to date. Dr. Morton therefore pleaded for a commission of British anatomists and teachers of final subjects to prepare a complete British nomenclature as far as possible in harmony with the Basel Nomenclature. An international conference might then be called to evolve a truly international nomenclature. He rapidly reviewed the principles upon which such a nomenclature should be based, and sketched out the manner in which these principles might be applied to the abdominal cavity and its contents. Mr. J. STEWART showed specimens from six recent *Abdominal operations*, illustrating difficulties in diagnosis. Mr. ALEXANDER SHARP showed a specimen of *Squamous-celled carcinoma of the larynx*. Mr. CONSTABLE HAYES showed a specimen (with photograph) of a large *Osteoma*, which caused secondary mastoid disease in a case of suppurative otitis media. Mr. WALTER THOMPSON exhibited a large *Malignant tumour of the bladder*, which had been successfully removed by a wide operation. Recurrence of the growth had, however, taken place after an interval. Dr. C. W. VINING showed a case of *Hysterical stupor*, which was improving under treatment. Mr. LITTLEWOOD showed a specimen of *Tuberculous mesenteric glands* which he had removed by operation. There had been a sinus communicating with the surface, and he had removed the sinus, glands, mesentery, and associated loop of bowel, performing an end-to-end anastomosis. The patient had made a good recovery. Cases and specimens were also shown by Dr. HELLIER, Mr. L. A. ROWDEN, Mr. E. W. BAIN, and Dr. M. J. STEWART.

SHEFFIELD MEDICO-CHIRURGICAL SOCIETY.

AT a meeting held on February 20th, the President, Dr. STANLEY RISELEY, in the chair, Mr. ARTHUR CONNELL, in a paper on the *Importance of careful treatment in injuries and infections of the fingers*, dealt specially with the infective conditions and their treatment by fomentations, etc. He referred to the great importance of making incisions so as to avoid infecting healthy tissues. When suppurative conditions developed about the nail it should be removed immediately. When an interphalangeal joint became infected amputation was preferable to excision. Mr. J. B. FERGUSON WILSON showed a specimen of *Torsion of the spermatic cord*. There was great enlargement of the testicle due to extravasation of blood into the epididymis and body. The condition began with a sudden onset five days before removal. There had been no injury and the testicle was fully descended. Dr. A. G. YATES showed two cases of *Exophthalmic goitre in men*. One patient had been taking thyroid extract for several months, but the result appeared to be wholly unsatisfactory. The desirability of operative treatment in these cases was discussed. Dr. R. G. ABERCROMBIE showed three forms of *Apparatus for treating injuries of the hands*: (1) A contrivance for exercising the grasp muscles, in which the principles of the lever were utilized so that at the beginning of the act of grasping, when the muscles were weak, the resistance was small; at the middle of the grasp, when the muscles were strongest, the resistance was at its maximum; and at the end of the grasp when the muscles were again weak, the resistance was again small. (2) A steel wristlet, provided with finger-stalls and straps, designed to overcome loss of flexion of the fingers caused by stiffness. The straps were to be gradually tightened, thus bringing the fingers into the position of flexion. (3) A grooved wooden wedge, intended to obviate the tendency, after a disarticulation of the finger at the metacarpo-phalangeal joint, of the two adjoining fingers to fall together, thus weakening the hand. The wedge was to be worn at night. Mr. GRAHAM SIMPSON showed a *Loose cartilaginous body* removed from the elbow-joint. It was about the size and shape of a bean and showed no fractured surface.

BRADFORD MEDICO-CHIRURGICAL SOCIETY.

AT the general meeting of the society, held on February 18th, a discussion on *Puerperal eclampsia* was introduced by Dr. E. W. SHARP. The "fit" was a common symptom, not the whole disease, which was a toxaemia where certain well-marked pre-eclamptic manifestations, notably headache, disturbance of vision, swelling of the face and extremities, and diminution in amount of urine, were commonly observed. The condition was quite distinct from uraemia and albuminura, and the toxin was not microbic, but akin to certain venoms, since it contained the same five elements—thrombotic, haemolytic, haem-agglutinative, endotheliolytic, and neurotoxic. Although apt to recur in subsequent pregnancies, eclampsia did not result in permanent nephritis. It occurred not only in normal but also in sterile molar pregnancies. It had been ascribed to imperfect balance of the internal secretions, those of the suprarenal and pituitary being increased, as evidenced by high blood pressure—a prominent feature of the disease—whilst the secretion of the thyroid diminished. Prophylaxis was of high importance in preventing the eclamptic attacks. When premonitory symptoms set in, rest, a strict milk and vegetarian diet, and a daily action of the bowels, were essential. When the attacks occurred Tweedy's methods were to be followed. The avoidance of external stimuli, the use of morphine, and the elimination of toxins by lavage of stomach and colon, were important measures. A concentrated solution of magnesium sulphate should be left in the stomach, and a pint of sodium bicarbonate in the rectum. Attempts should be made to lower the blood pressure; in many cases venesection was valuable, as was veratrum viride or nitroglycerine. Where intravenous infusion became necessary sodium bicarbonate was better than normal saline fluid. If swallowing were possible frequent draughts of water should be given, but no food. Diaphoresis was not recommended, and lumbar puncture was useless. Dr. Sharp was not in favour of inducing labour. When it occurred it should be assisted,

but not forced, natural delivery being preferable to artificial methods. *Accouchement forcé* was not good practice. When the os would not dilate, and pains were strong, Caesarean section was greatly to be preferred.

NORTH OF ENGLAND OBSTETRICAL AND GYNAECOLOGICAL SOCIETY.

AT a meeting held on February 21st, Dr. W. E. FOTHERGILL (Manchester), President, in the chair, Dr. GEMMELL (Liverpool) showed a specimen of *Adhesion of the vermiform appendix to the right Fallopian tube.* The left tube and ovary were the seat of a tubo-ovarian abscess. The history showed that the primary mischief was probably appendicular. Dr. GRIMSDALE (Liverpool) brought forward a specimen of *Carcinoma of the body of the uterus* from a patient whose ovaries were removed three years previously, and showed suspicious appearances suggesting malignancy. Dr. GEMMELL exhibited two cases of *Ectopic gestation:* (1) A secondary abdominal pregnancy with seven months fetus and with a very clearly defined history; (2) an isthmal pregnancy in the left tube of six weeks' duration, the source of very severe intraperitoneal haemorrhage. The abdominal ostium was free from any sign of haemorrhage and no laceration of the tubal wall or sac could be detected. Dr. FLETCHER SHAW (Manchester) showed a *Fibromyoma of the uterus complicated by an abscess in the right broad ligament* from which a pure culture of streptococci was obtained. Eight years previously abortion and septic infection had occurred, but from that time until the sudden onset of the pelvic inflammation the patient's health had been good. Dr. BLAIR BELL (Liverpool) showed a case of *Superinvolution of the uterus with exophthalmic goitre* in a woman aged 25. Her health had been good until the birth of her first child, eleven months previously. Lactation failed within a few weeks and the thyroid enlarged, all the symptoms of exophthalmic goitre developing in a short time. The uterus was very small, the cavity being reduced to 2 in. in length. The case was of great interest owing to the fact that superinvolution appeared more likely to follow deficient thyroid secretion than the reverse. Dr. CATHERINE CHISHOLM (Manchester) read a paper on *The nature and extent of menstrual molimina during adolescence*, based upon the menstrual history of 500 girls attending school between the ages of 10 and 20. The majority, 58.6 per cent., experienced no discomfort. In 33.6 the pain was slight and often only occasional; those suffering discomfort experienced rather local symptoms than general disturbance such as headache or general lassitude. The tendency to disturbance did not appear affected by the age of onset. Severe cases of pain, so far as there was opportunity for examination, were associated with local abnormalities. The largest number of cases with discomfort and pain occurred among anaemic girls with profuse loss. The best physically-developed girls showed over 70 per cent. without any disturbance and with no cases of pain which incapacitated them from work. Hard mental and physical work under healthy conditions did not appear to affect the freedom from menstrual disturbance.

HARVEIAN SOCIETY.

AT a meeting held on February 20th, a discussion on the *Diagnosis of acute abdominal conditions in children* was opened by Dr. EDMUND CAUTLEY. The diagnosis of acute abdominal conditions necessitated a mental inventory of all the affections which might give rise to the observed symptoms. For accurate diagnosis an exploratory operation might be indispensable. Cases could be quoted illustrative of the difficulty in diagnosing severe intestinal colic from organic disease; others in which exploration had been done unnecessarily; and lastly, others in which such treatment would have saved the life of the patient. The question essentially turned on diagnosis. It was admitted that the "look and see" method of diagnosis was sometimes justifiable, but it was a moot point whether the surgeon was always the right person to decide if there were sufficient evidence to warrant exploration. The modern physician was not ever averse to operative measures; indeed, he was often more surgical in his opinion than the surgeon. Many acute abdominal conditions might be mistaken for affections amenable to surgical treatment. Pleurisy, pneumonia, Henoch's purpura, haemorrhagic colitis, and the onset of coma in diabetes, had all been explored on account of intestinal symptoms suggestive of abdominal disease. The main symptoms and physical signs on which a differential diagnosis could be based were vomiting, abdominal pain, constipation, the condition of the abdomen, the abdominal facies, collapse, toxaemia, pulse-rate, respiration and body temperature. These were considered in relation to the chief diseases, notably appendicitis, intussusception, intestinal obstruction, peritonitis, and simple colic. Special attention was paid to Henoch's purpura, because it might be mistaken for intussusception, a complication which might occur during its course. Many diseases could be excluded in the case of children mainly on account of their rarity, still it was necessary to bear in mind as possibilities—gastric crises in tabes dorsalis, perforation of simple gastric or duodenal ulcer, acute pancreatitis, cholecystitis and gall stones, renal colic, embolism or thrombosis of the mesenteric artery, and lead colic. Tuberculous peritonitis might give rise to misleading symptoms of obstruction due to bands or adhesions, the vomiting and constipation being really signs of the onset of meningitis. Of the utmost importance in inflammatory affections was the absence of abdominal movement and the presence of abdominal rigidity and tenderness. The rigidity might be the chief sign indicative of danger during the temporary improvement due to the relief of tension in a case of appendicitis. In all cases of colic a dietetic cause must be sought for, but the presence of such a factor was not always the explanation. Many cases of appendicitis in the early stage were ascribed by parents, and even doctors, to unsuitable food. A rise of temperature in such cases was of considerable assistance. Probably in all doubtful cases it was to the advantage of the patient that both a physician and surgeon should be called in consultation before deciding that exploration was essential. Mr. EDRED CORNER pointed out the probable cause of acute abdominal conditions depended greatly on the age of the individual. Sir JAMES GOODHART related a number of interesting cases, and Mr. LOW, Sir JOHN BROADBENT, Mr. FITZWILLIAMS, Dr. CLAYE SHAW, and the PRESIDENT all took part in the discussion.

HUNTERIAN SOCIETY.

A CLINICAL afternoon was held at the London Hospital on February 26th, the President (Mr. A. H. TUBBY) in the chair. Dr. PANTON demonstrated cases and blood films illustrating the various types of the *Non-granular leukaemias*—acute myeloid leukaemia; chloroma, with the blood changes of acute myeloid leukaemia; the myeloblastic stage of chronic myeloid leukaemia; acute lymphoid leukaemia; and also 5 cases of chronic lymphoid leukaemia. Dr. S. GILBERT SCOTT exhibited radiograms of *Bone diseases*, innocent and malignant, and of *Pituitary tumour*, etc. Dr. LEWIS SMITH brought forward a case of *Polycythaemia* associated with congential morbus cordis in a boy. Dr. J. H. SEQUIERA showed a remarkable instance of *Multiple lupus.* Dr. HUTCHISON showed: (1) A photograph of a girl, aged 3 years, the subject of *Acute myeloid leukaemia* with infiltration of both parotids and swelling of all the lymphatic glands. (2) A case of probable early *Acromegaly* in a man of 42. Mr. HUGH LETT demonstrated a case of *Cervical ribs* in a woman, aged 27. There had been pain along the inner side of the right arm and forearm for two years. The corresponding hand grew tired more easily than the left, and was very susceptible to cold weather; it showed marked wasting of the interossei and the muscles of the thenar and hyperthenar eminences. There was some loss of sensation on the inner side of the forearm and hand. The pulse in the right radial artery was relatively small. No bony tumour could be felt in the neck, but a skiagram showed two bony projections, apparently 1½ in. long, extending downwards and outwards from the transverse processes of the seventh cervical vertebra. Mr L. J. AUSTIN, Surgical Registrar, showed: (1) A case of *Pancreatic cyst*, under Mr. Furnivall. This patient, aged 52, presented a large tense glandular swelling in the upper part of the abdomen, which had developed nine months after a severe

blow with the pole of a cart. (2) A case of *Osteitis deformans*, under Dr. F. J. Smith. The characteristic changes in the skull, spine, and tibiae were marked; some satisfactory *x*-ray plates were also exhibited. (3) A specimen of *Chronic gastric and duodenal ulcers*, from a case under Mr. Sherren, which had ended fatally by haemorrhage, and a series of 7 cases of *Duodenal ulcers*, showing the results of surgical treatment.

LONDON DERMATOLOGICAL SOCIETY.

AT a meeting held on February 18th, Dr. MORGAN DOCKRELL in the chair, Dr. J. L. BUNCH showed a man, aged 50, with a marked hereditary and symmetrical *Dupuytren's contraction of the fingers*. This malady had existed in the patient's family for the past 300 years, commencing about the age of 25 and reaching the maximum at about 40. The father, grandfather, and so on, had had exactly the same lesions, and so his two sons both had it, the contraction just beginning in one of them, a man aged 26. Dr. Bunch also showed a woman, aged 64, with some *Scarring* on the nose and a small *Tumour* on back of neck. The former was either tuberculous or syphilitic, whilst the latter was a cyst. The PRESIDENT, Drs. VINRACE, PROSSER WHITE, GRIFFITH, SIBLEY, WELLS, and PHIBBS discussed the cases. The PRESIDENT exhibited a man, aged 35, with some old-standing *Specific scars* and depressions on the scalp, the severity of which was associated with a tuberculous soil. Dr. GRIFFITH showed a man who presented a *Diffuse area of livid red skin*, involving the whole of the bathing drawers area. The Wassermann reaction was negative, and histologically it presented the condition of parakeratosis, and he considered it one of erythrodermia. Dr. KNOWSLEY SIBLEY showed a case of advanced *Leucoderma* in a girl, aged 18. The treatment consisted in increasing the pigment in the pale areas by local hyperaemia, and removing it from the pigmented ones by lotions of mercury perchloride, applied by ionization. Dr. Sibley also showed a case of extensive *Scrofuloderma* in a girl, aged 9; some of the lupous lesions he was treating with ether carbon dioxide, and others with ionization of zinc sulphate solution. Dr. PROSSER WHITE of Wigan read a paper on the *Sociological aspect of syphilis*, in which the point was emphasized that the first thing to enable a disease to be controlled was to know its extent. In Scandinavian countries compulsory notification of syphilis was enforced, its seriousness being only too well recognized, and rational attempts were made to check it. Venereal disease was probably more disastrous to the health of a country than either tubercle or alcohol, yet the public showed apathy towards the former, as compared with the interest it took in the two latter questions. Again, syphilis was much more easily controlled by treatment than either the other conditions. Modern intensive treatment by healing up the early and secondary lesions of syphilis proved valuable, especially as a prophylactic measure. The Continent, America, and the colonies were demanding free treatment by experts. How long must we delay? The PRESIDENT, Drs. SIBLEY, VINRACE, GRIFFITH, and REEVE joined in the discussion.

THE report presented to the annual meeting of the County of London Branch of the British Red Cross Society, held at Grosvenor House on February 28th, showed that during the year one men's and nine women's detachments had been raised, while one women's detachment had been disbanded, leaving the total number in existence at the end of 1912 at four men's and forty-eight women's detachments. Sir Launcelot Gubbins, Director-General of the Army Medical Service, in moving the adoption of the report, said that the Red Cross now had 1,959 detachments, with a strength of nearly 60,000, of which about 20,000 were men. It was very desirable that voluntary aid bodies should keep themselves up to the mark of efficiency for any duties that might fall upon them in time of emergency. Sanction had been given to the formation of cadres, to consist of three officers and five of other rank, to help in co-ordinating and training in peace time the voluntary aid detachments, and also on mobilization to take some of the burdens off the shoulders of the county director.

Reviews.

THE HOUSE OF LIFE.

THERE are few severer tests of mastery than the writing of a short and simple book upon a great and difficult subject. Professor KEITH, in his contribution to the "Home University Library" of a short account of the development, structure, and leading functions of *The Human Body*,[1] has produced a work which, while in the main it will prove intelligible to the general reader, is also full of interest for the professional student. The author has wisely refrained from the impossible task of compressing within some 250 brief pages a comprehensive account of human anatomy and physiology, contenting himself with a successful effort to indicate the broad features of our present knowledge, the central problems that still confront us, and the methods by which our surest results have been attained in the past and may be enhanced in the future. Thus, in the chapter dealing with the brain, an interesting account of Charles Bell's great discovery of the distinction between sensory and motor nerves at once serves to illustrate the nature of scientific induction and to impress upon the reader's mind a fact of fundamental importance. In the third chapter we are given a brief survey of the considerations determining the assignment of man to one of the three families included among the higher primates. Of these three families the central position is occupied by the great anthropoids, while the gibbon, on the one side, has adhered to the ancestral form, and man, on the other, has aberrantly evolved to his present position. The existence of the great anthropoids is, Professor Keith thinks, menaced by the extension of civilization. The big forms of primates (gorilla, chimpanzee, orang, and man) form a group of approximately uniform size; and since fossil remains of big anthropoids, belonging presumably to the same ancestral stock, have been found in Miocene strata, the size of our bodies may be regarded as an inheritance which has come down to us unchanged through millions of years. The human form of foot, associated with the erect posture, is also a very ancient character, very much more so, for example, than the large brain.

One of the most valuable features of the book is its wealth of confirmatory evidence of the general evolutionary position. Among these may be mentioned the transition, during the later months of embryonic development, from the pronograde to the orthograde type of mesenteric attachment; the occasional presence in man of the levator claviculae, used by pronograde monkeys to advance the shoulder in running; the vestigial survival of the plantaris longus and the psoas minor muscles; the human liability to hernia, resulting from that weakening of the abdominal wall which has been produced by the adoption of the upright posture; the occasional persistence of the urogenital cloaca, and the occurrence of supernumerary nipples. Such facts are explicable only on the supposition that man has been evolved from the lowest forms of animal life. The fact that the ancestral stages of man's development are but imperfectly recapitulated by those of intrauterine life, is attributed by the author to a modification of the latter process evoked by the special conditions under which it takes place.

In the chapter dealing with sexual traits Professor Keith explains the predominantly thoracic respiration of women by the necessity of minimizing the pressure to which the fetus is subjected during pregnancy. Tracing the sexual differences found in man and the anthropoids to that common primate stock which appeared in an early stage of the Miocene period, he concludes that, since these differences have remained stable for many millions of years, there is no foundation for the view held by certain feminists and others that civilization will in the near future produce a structural or functional equality of the two sexes. An interesting point in connexion with the human hand is the fact that the flexion lines on the palm, which most people would agree to regard as acquired characters, appear on the fetal hand before its movements have actually begun. In view of this fact, Professor

[1] *The Human Body*. By Arthur Keith, M.D., LL.D. Home University Library of Modern Knowledge. New York: H. Holt and Co. London: Williams and Norgate. 1913. (Fcap. 8vo, pp. 256. 1s. net.)

Keith inclines to the belief that use-characters may under some circumstances be inherited. The author adduces reasons for his opinion that retrograde changes are at work on the faces and jaws of highly civilized peoples, probably due to the adoption of a diet which makes an insufficient demand upon the functional potentialities of these parts. To the same cause he attributes that retrogression of the appendix and the colic system which has led Metchnikoff to condemn these structures as useless and dangerous encumbrances of the human organism—a condemnation which, however, the author declines to endorse. In the same chapter he sounds a much-needed note of warning as to the mischievous effects produced by excessive and faulty muscular training upon the lungs and heart.

The concluding chapter deals with the question of the antiquity of man. His traces can be followed back to the end of the Pliocene period; that of the primates leads up from the Eocene to the middle of the Miocene. Somewhere between these two lies the point at which man emerged from this ancestral stock.

We have indicated but a few of the interesting features which make Professor Keith's little book a source of interest and delight. It only remains to express our appreciation of the charming style in which its wealth of information is conveyed.

SPECIFIC FEVERS.

THE book on scarlet fever[2] by the late Professor ESCHERICH and Dr. BÉLA SCHICK belongs to the series of Nothnagel's *Spezielle Pathologie und Therapie*, now edited by Professor von Frankl-Hochwart. It well maintains the high standard of the earlier volumes. Owing to the lamented death of Professor Escherich after the completion of the chapters on the history, epidemiology, and pathogenesis of scarlet fever, the later sections are entirely written by Dr. Béla Schick, who claims faithfully to have presented his teacher's views. The book is written in a scientific spirit, and embodies the latest researches. As was to be expected of a work for which the well-known Viennese professor was chiefly responsible, it is by no means a mere compilation. Popischill's observations on 2,372 scarlet fever patients, half of whom were given meat and half an exclusively milk diet, seem to show that the prophylactic value of milk as regards scarlatinal nephritis is illusory. The authors hold that the results warrant a relaxation of strictness, if milk becomes repugnant. They recommend that even the mildest cases should be kept in bed for four weeks, for, though the patient may appear to be in perfect health, the disposition to relapse and to post-scarlatinal diseases increases during the third and fourth week. This may be due to the formation of reaction-bodies towards the end of the second week, which usher in a period of specific hypersensitiveness. Probably these anaphylactic bodies are at first formed more rapidly than the antitoxic reaction-bodies. Professor Escherich was an enthusiastic believer in the efficacy of Moser's immunizing serum, and the section dealing with this method of treatment is of great interest. As the dose is no less than 200 c.cm., serum sickness is common after its administration. Hence it should be used only in cases in which the prognosis is obviously bad. The best results are obtained in toxic scarlet fever, in which the danger arises from the severity of the specific infection. In severe septic cases—that is, cases with suppurative and necrotic complications in the throat, nose, ear, and cervical glands due to secondary infection—it is useless, unless given at the first onset of dangerous symptoms. The book should prove valuable both to the specialist and general practitioner.

In the preface of Dr. CLAUDE B. KER'S little book, *A Manual of Fevers*,[3] it is stated that the object with which it was written is "to give in a compact form the information likely to be required to supplement the practical work" of the demonstrations in the wards of a fever hospital. For such a purpose the book is eminently adapted. The clinical teacher in the fever hospital has to make use of opportunities as they present themselves, and he is seldom in a position to demonstrate the events of disease in their complete sequence. But the student, if he is to get the full value of the demonstrations, should possess a general knowledge of these events, and to obtain this knowledge he will find this book exceedingly useful. It is one to be read just before attendance on a course of instruction at a fever hospital. Clinical details will be pointed out at the hospital, and details on other subjects—epidemiological, pathological, etc.—can be looked up, as occasion demands, in one of the large textbooks, of which there are now several. For the general practitioner this manual is hardly full enough. On one or two points we differ from the opinion of the author. Is 20 lb. to the square inch really necessary for satisfactory penetration of the steam in a disinfecting machine provided with a vacuum producer? Are the prodromal rashes of measles rare? In London they occur in about 40 per cent. of the cases. Is the scarlatina patient more likely to suffer from a relapse than is the convalescent from any other eruptive fever? Dr. Ker must for the moment have forgotten enteric fever when he wrote this statement. In the discussion on the diagnosis of small-pox the student should be warned against mistaking the haemorrhagic form for purpura haemorrhagica. We have more than once known this error to be made with disastrous results. Omissions such as this are, however, very few, and we hope that the speedy appearance of a new edition will enable them to be supplied. We may add that the book is provided with several excellent black-and-white reproductions of photographs of typical eruptions.

We are very glad that Dr. WOOLLACOTT'S book, *The Nursing of Infectious Diseases*,[4] has reached a second edition. We have had occasion to remark when noticing other books on this subject, that they appeared to be designed rather for junior practitioners than for nurses, in that questions of treatment were discussed which were really no concern of the latter. This work is quite free from that blemish. The nurse who has carefully studied it, what time she has been going through a course of fever training, should be well fitted to undertake the nursing of infectious cases. The facts which it is essential she should know are stated in simple and clear language, and we have not detected any serious omission. We hope the book will continue to be widely read. We can strongly recommend it to those nurses who intend to present themselves for the examinations of the Fever Nurses' Association or other like tests. We suggest to the author that in the next edition he should enter into a little more detail on the subjects of intubation, and of barrier, cubicle and separate room nursing; and add a short chapter on erysipelas, cerebro-spinal fever, and puerperal fever.

DISEASES OF THE SKIN.

ALTHOUGH many books have been written during recent years upon *x* rays, *The X-ray Treatment of Skin Diseases*,[5] by Dr. FRANK SCHULTZ, is the first work which we remember to have seen dealing exclusively with the *x*-ray treatment of skin disease. The author divides his subject into three parts—a physical part, a section on general *x*-ray therapeutics, and lastly a section on special therapeutics. In the last section every skin disease which is susceptible to *x*-ray treatment is mentioned separately, and the result which may be expected from the prescribed method of treatment is indicated. The physical section is very clear and well put, but does not contain anything very new or striking. There is a very good account of the apparatus required for the production of *x* rays, including various devices for reducing reverse current, for measuring the hardness of the rays and the quantity of radiation. In this section are also to be found the various methods of measuring the dose of *x* rays administered. Dr. Schultz

[2] *Scharlach.* By the late Professor Dr. Theodore Escherich and Dr. Béla Schick. Vienna and Leipzig: Alfred Holder. 1912. (Roy. 8vo, pp. 263: 59 charts, 3 plates. Mk. 7 60.)

[3] *A Manual of Fevers.* By Claude Buchanan Ker, M.D., F.R.C.P. Edin. London: Henry Frowde and Hodder and Stoughton. 1911. (Post 8vo, pp. 328; 6 plates, 14 charts. 7s. 6d. net.

[4] *Lectures upon the Nursing of Infectious Diseases.* By F. J. Woollacott, M.A., M.D., B.Ch.Oxon., D.P.H., Senior Assistant Medical Officer, Grove Hospital, Metropolitan Asylums Board. Second edition. London: The Scientific Press, Ltd. 1912. (Crown 8vo, pp. 158. 2s. 6d. net.)

[5] *The X-ray Treatment of Skin Diseases.* By Dr. Frank Schultz, Physician-in-Chief of the Light Department at the Royal University Polyclinic for Skin Diseases, Berlin. Translated by James Burnet, M.A., M.D., M.R.C.P.Edin. London: Rebman, Limited. 1912. (Roy. 8vo, pp. 174; figs. 81. 12s. 6d.)

employs the Sabouraud-Noiré pastille in combination with a milliampere and parallel spark-gap whereby the constancy of the tube is controlled. In the section on general therapeutics several interesting questions are discussed. Dr. Schultz holds the generally accepted opinion that there is no such thing as a hypersensibility of normal skin to *x* rays, but he gives an example of limited hypersensibility occurring in disease—the case of a woman who had neurodermatitis of the face, which after a very mild radiation gave a reaction of the second degree. As regards the explanation of the selective action of *x* rays on different kinds of tissue, Dr. Schultz refuses to accept the theory that embryonic and young cells are particularly sensitive. He lays stress on the specific sensibility of each kind of cell, but he holds that this specific sensibility is not connected with a special variety of cell recognizable histologically. As it is well known that the physical property of every material which conditions its power of absorption of *x* rays is its specific weight, the author holds that the specific weight of the various tissues exerts a great (although not the only) influence in determining their sensitiveness to the rays. Another new feature of some interest is the author's employment in certain cases of extremely soft tubes. It has long been known that a Sabouraud pastille dose from a very soft tube will cause a marked reaction, although the same dose delivered from a harder tube will not cause any reaction at all. Advantage has been taken of this fact to use very soft tubes (2.5 Wehnelt) for treating, apparently with excellent results, superficial naevi and also certain rodent ulcers which have proved refractory to harder rays. At the same time a warning is given that only very superficial malignant growths should be treated with these very soft rays because they have very little penetrating power. It therefore follows that any malignant tissue at a greater depth than about 3 mm. will receive not a killing but an irritative dose, and thereby will be encouraged to proliferate. The section on special therapeutics shows well what a wonderful power for good *x* rays can exert in skilled hands, but Dr. Schultz does not hesitate to warn us against their use in unsuitable cases. This section—and, in fact, the whole book—is written in a praiseworthy spirit of impartiality and with strict regard for scientific accuracy. It should be read by all dermatologists and radiologists, but preferably in German, for the translation is very far from good, and sometimes fails clearly to convey the meaning of the original.

In his treatise on diseases of the skin, Dr. WILLMOTT EVANS[6] has written a very useful book. This work is among the first volumes issued by the new University of London Press, and it may not be out of place here to remark that the general style and get-up is neat and attractive. Dr. Evans has, he tells us in the preface, been struck with the advanced character of most books on dermatology, which often can only properly be appreciated by those who are of considerable experience in the subject. He has, therefore, written the present work in as simple a style as is consistent with correctness and accuracy of description. Furthermore, the reader is aided in his perusal by clear headings to the chapters and paragraphs. The classification of skin diseases is a notoriously difficult subject, and it is always interesting to observe how an author approaches it. In the present instance a mixed classification is adopted; where possible, diseases of a definite and similar etiology are grouped together; where this has not been possible a pathological scheme has been followed, and, finally, diseases of the sweat glands, sebaceous glands, hair follicles, and nails have received separate attention. Such a classification, which, as Dr. Evans admits, is not strictly scientific, is justified on grounds of convenience. Although he has written a comparatively short book, he has produced a very complete treatise, for practically every pathological condition of the skin receives its meed of attention—in fact, perhaps, the usefulness of the volume to beginners in dermatology, for whom especially it is intended, would be enhanced, were some of the very rare conditions omitted, or at least the space devoted to them reduced, and the more important diseases of the skin discussed more fully instead. For example, only a page and a half is given to rodent ulcer, while six pages are taken up by leprosy; for this country, at all events, the proportions ought to be reversed. In some cases the directions for treatment are rather vague. For example, it would be impossible for any one who knew nothing about the intramuscular administration of mercury in syphilis to learn from reading this book how to give mercury in that way; nor, although salvarsan is mentioned, are any directions given for its administration by any method whatever. Apart, however, from a few omissions such as this, the student will be able to gain a very sound knowledge of diseases of the skin from the study of Dr. Evans's work. The illustrations, which are almost all original, are suitable, good, and well reproduced. The typography is very correct; in fact, we have detected only one misprint—on page 113, Tinia for "Tinea."

In reading Dr. KNOWSLEY SIBLEY's little book on the *Treatment of Skin Diseases*[7] it is easy to see that he is an enthusiast for the application to dermatology of Bier's methods of producing hyperaemia; the longest section of the work is devoted to this subject. There is no doubt that these methods are worthy of more attention than has been paid to them by most dermatologists. The whole book consists of three parts. The first is devoted to the description of special methods of treatment, among which the production of hyperaemia is most conspicuous; the second consists of a list of skin diseases in alphabetical order, with the appropriate methods of treatment indicated in each case; and the third of a large number of prescriptions of rather unequal value. An experienced dermatologist would be able to pick up valuable hints in some cases, but for other readers the directions given are not always precise enough to be of much help. Long lists of drugs and local applications are given which are said to be useful in various diseases, but no definite plan of campaign is laid down. The book suffers from a want of attention to literary style.

The first edition of Dr. SCHAMBERG'S *Diseases of the Skin and the Eruptive Fevers*[8] was favourably reviewed in these columns some years ago. In preparing the second edition the original has undergone complete revision, and new chapters have been added. As is well known, the subject of pellagra has been claiming much attention in the United States, numerous cases having come to light there. The details on this disease have been amplified, and should prove useful, especially at the present moment, when the distribution of pellagra has been shown by Drs. Sambon and Chalmers to include Great Britain. Grain-itch has been added. Dr. Schamberg and Dr. Goldberger have had special opportunities of studying this affection in Philadelphia, where a number of cases came under their observation. Fresh chapters, too, are those on sporotrichosis, vaccine-therapy, and CO_2 snow treatment. The rashes of the acute exanthemata and of various infectious diseases are included, and form a useful addition to a good account of diseases of the skin. The illustrations are uniformly good.

LAW FOR MEDICAL MEN.

DR. FRED. J. SMITH, Physician to the London Hospital and editor of that standard work *Taylor's Medical Jurisprudence*, supplies a most valuable addition to the library of the practitioner in *Law for Medical Men*,[9] a volume well worth the half-guinea which is its price.

Dr. Smith points out that the National Insurance Act, 1911, which has disturbed and shaken the medical profession through and through, may be regarded as the

[6] *Diseases of the Skin.* By Willmott Evans, M.D., B.Sc., F.R.C.S. London Medical Publications. London: University of London Press. 1913. (Demy 8vo, pp. 386, with 1 coloured plate and 31 other illustrations. 10s. 6d. net.)

[7] *The Treatment of Diseases of the Skin.* By W. Knowsley Sibley, M.D., M.R.C.P. London: Edward Arnold. 1912. (Cr. 8vo, pp. 286, 7 photographs. 5s. net.)

[8] *Diseases of the Skin and the Eruptive Fevers.* By Jay Frank Schamberg, A.B., M.D., of Philadelphia. Second edition. Philadelphia and London: W. B. Saunders Company. 1911. (Med. 8vo, pp. 573; 235 figs. 13s. net.)

[9] *Law for Medical Men.* A Book for Practitioners containing Extracts from Acts of Parliament interesting to Medical Men. By Fred. J. Smith, M.D., F.R.C.P., Physician to the London Hospital, editor of *Taylor's Medical Jurisprudence*, Referee under the Workmen's Compensation Act, etc. London: J. and A. Churchill. 1913. (Demy 8vo, pp. 414. 10s. 6d net.)

conversion of the medical profession into a branch of the Civil Service of the State—an uncovenanted service it may be added. Legislation during the last hundred years, and especially the frenzied legislation of the last ten, compels medical men to a knowledge of Acts of Parliament which are now becoming so numerous and intricate that it is impossible to master the full details of them all, and extremely difficult for officials to be certain whether they may exercise final authority under a given Act or whether they may not find themselves struggling against a superior authority under another amending Act.

Hence the value of this work, which deals very clearly with a very large number of Acts so far as they affect medical men, who, by reference to the complete index, can readily find the information they require. The author's notes are valuable, and we quote a reasonable suggestion of his with regard to the proof of drunkenness which may be of interest to divisional surgeons—and others.

The events of a recent railway strike in the North of England will be fresh in the minds of our readers. An engine-driver was convicted of drunkenness when off duty by a local bench of magistrates, and consequently was dismissed by his board of directors. Other railway servants, resenting this, went on strike by way of insisting upon the reinstatement of the engine-driver. After much hardship and suffering, honour was eventually satisfied, and peace and hilarity restored by the visit of a London stipendiary magistrate, who held an inquiry into the circumstances of the case, and found that the engine-driver, on the occasion of his conviction, had not been "drunk in the police-court sense." On this point Dr. Smith is very interesting in his comments upon Section 1 of the Inebriates Act, 1898. His definition of drunkenness is: "Drunkenness is the [not an] effect of alcohol [and certain other substances] upon a person." He suggests:

> If the Court is satisfied from the evidence that the offence was committed under the influence of drink—and my contention is that a medical man (or a policeman or other witness for that matter) is, or should rather, not be called upon to say whether a man was or was not drunk (in the common acceptance of the word) but simply to prove the fact (usually very easy) that he had drunk some intoxicating liquor—this in my definition is "drunk," and then it is for the Court to decide, after hearing all the evidence as to his manner, etc., whether the offender would have done what he did do if he had not taken the liquor; if "No, he would not," then he was drunk within the meaning of the Act; if "Yes, he would," then the Court decides that he was not drunk within the meaning of the Act. This at any rate would throw the onus on the Court, and would do away with the mass of conflicting evidence, always given, as to whether he was drunk or not in the ordinary acceptance of the term, which on the above words of the section is quite irrelevant; for the Court has to decide whether the act was done under the "influence" of drink quite irrespective of the degree of that influence.

There seems to be much sense in this, as indeed there is in most of the comments of the author of this excellent work of reference.

TROPICAL MEDICINE FOR LAYMEN.

The Prevention and Treatment of Disease in the Tropics[10] is the title of a useful little handbook by Dr. EDWARD S. CRISPIN, Assistant Director of the Sudan Medical Department. It has been compiled chiefly to meet the needs of officials in the Sudan, for, as the author states in his preface, any officer may be called upon to act medically in the tropics, and it is as well that the layman should have some handbook such as this to guide him. It is divided into two parts, dealing with prevention and treatment respectively. The first part includes an account of methods of destroying the various disease-carrying insects, and for protecting man from their attacks. Personal hygiene, including clothing, food and drink, are next considered. Under the head of treatment most of the common tropical complaints are dealt with; and two appendices deal with antiseptics, diets, weights and measures, dosage, and lists of drugs, appliances, etc. The handbook is purely meant for the layman, and as such can be recommended. It would be as well to mention under blackwater fever that the patient must on no account be allowed to get out of bed, that the quantity of urine should be accurately measured, and that the temperature should be carefully taken at least every four hours. Blackwater fever is a disease for which careful nursing will do far more than any drug. Still, a handbook is a handbook, and too much detail cannot perhaps be incorporated in it. It is in this that handbooks often fail—too many pages but not enough in them. The layman will find a fund of information contained within the pages of the little book, however, and, as already stated, it can be thoroughly recommended to him.

Some Factors Influencing Health in Tropical and Subtropical Countries is the title of a little handbook[11] by Dr. GARRY that will be found useful by the laity. It contains much useful information, and is for the most part accurate and to the point. It is not, of course, correct, when talking of insects acting as intermediary hosts, to say that the *bacilli* multiply and develop and finally originate a variety of diseases, such as malaria, trypanosomiasis, etc. The layman of the present day is not quite so ignorant as that, or, even if he is, there is no reason why he should remain so. It is better to avoid such loose statements and to stick accurately to facts when writing handbooks for the public of the present day. One chapter of special interest is that on the type of man suited for service in the tropics; this very important question ought to be thoroughly inquired into. The unfit and physically unsound are certainly much better out of the tropics, and the mentally unstable should be added to the frivolous woman type specially commented on by the author. In the chapter on the prevention of disease a serious charge is laid against the humble ant; Dr. Garry states that he has satisfied himself by some recent preliminary investigations that these creatures are largely responsible for the wide prevalence of diseases due to animal parasites, and that in bilharzia they act at least as one of the principal modes of infection. It would have been interesting and instructive if Dr. Garry had stated how. Though some of the scientific facts are somewhat loosely stated, the other matter is quite good, and may with safety be read and digested by the would-be sojourner in the tropics.

NOTES ON BOOKS.

AMONG the more special of the papers in the thirty-ninth volume of the *St. Thomas's Hospital Reports*[12] is that by Mr. C. M. Page on the results of the operation of suprapubic prostatectomy, 1906–10. In 1910, out of 13 radical operations for enlarged prostate, 11 recovered and 2 died; out of 15 similar operations in 1911, 13 recovered and 2 died. Prostatectomy in general hospital practice shows a distinct inferiority when compared with the figures of individual operators, but hospital patients are often in a very bad general condition. From the St. Thomas's Hospital figures, taken from the tables of cases of enlarged prostate under every kind of treatment, Mr. Page finds that the death-rate for cases treated by simple catherization or suprapubic drainage is practically the same as for cases in which the complete operation has been performed. Here, again, as Mr. Page points out, many of the cases entering hospital have been lo g neglected, and secondary kidney changes are therefore common. Dr. Atholl Ross contributes the important Salter Research Report, 1910, a General Survey and Analysis of Cases treated by Bacterial Vaccines at St. Thomas's Hospital. There are besides several other instructive clinical, surgical, and laboratory work.

We have received the *Official Year Book of the Scientific and Learned Societies of Great Britain and Ireland* (London, Griffin and Co), twenty-ninth annual issue, being, as the title page informs us, a record of the work done in science, literature, and art during the session 1911–12. It is a useful publication, largely on account of the lists of names of papers read before various societies, as, for instance, at the annual meeting of the Association, and before the now numerous sections of the Royal Society of Medicine.

[10] *The Prevention and Treatment of Disease in the Tropics; a Handbook for Officials and Travellers.* By Edward S. Crispin, M.R.C.S., L.R.C.P. London: Charles Griffin and Co., Ltd. 1912. (Fcap. 8vo, pp. 95. 1s. net.)

[11] *Some Factors Influencing Health in Tropical and Subtropical Countries.* By T. Gerald Garry, M.D. London: John Bale, Sons, and Danielsson, Ltd. 1911. (Cr 8vo, pp. 106. 2s. 6d. net.)

[12] *St. Thomas's Hospital Reports: New Series.* Edited by Dr. J. J. Perkins and Mr. C. A. Ballance. Vol. xxxix. London: J. and A. Churchill. 1912. (Demy 8vo, pp. 250. 8s. 6d. net.)

Thus it will save many of us great trouble involved in hunting up the now numerous archives of our societies in which so many hundreds of carefully prepared papers rest unworthily forgotten or overlooked.

The multiplicity of learned and other societies is staggering and yearly becomes worse. Amalgamation is one remedy for this evil, and we have witnessed it in the well-known instance of the Royal Society of Medicine. A central office for intercommunication is another agent for avoiding intellectual waste. Dr. EIJKMAN explains his views on the maintenance of such an office in *L'Internationalisme Scientifique*.[13] His exposition fills 108 pages of the text, and the remainder of the volume is taken up by notices of the names and objects of 614 societies. The Hague is the seat of pacificism, and already Dr. Eijkman has compiled another work, *L'Internationalisme Médical*, similar to but, as its name implies, more specialized than the book now under notice. The explanation of his system is based by Dr. Eijkman on the principles to which we have referred above. We all feel when we read the words "scientific" and "international" together that great as is the wastage of good work in any one country it must be far greater in the case of all good work imbedded in the archives of foreign lands. The notes show that Dr. Eijkman has the broadest views about science, or, rather, he not only desires science to be international but he also aims at making internationalism a science, so that associations for the diffusion of Esperanto, for Zionism, anti-Zionism, Theosophy, pure literature, and so forth, are included in his notes. The Salvation Army, which is hardly scientific but decidedly international, is to be found amidst rubber testing committees, Catholic, Protestant, and Liberal Christian associations and societies for the promotion of the rights of women. Dr. Eijkman groups all these divergent bodies under their proper classes. He concludes that the development of international organizations has made great strides, even within his own experience. The main aim, after all, he openly avows, is pacificism; the international organization of science aids men in nearing, if not attaining, that noble object. The author does not seek to make the Dutch official metropolis into a scientific Rome, but the Permanent Committee of International Medical Congresses, already in working order, has shown how such a general bureau may be worked. Dr. Eijkman seeks to establish such a bureau, and offers suggestions as to how his object may be effected. Of necessity it is held advisable that all associations of the types included in the author's wide programme should communicate with him.

The volumes of the work edited by Professor SOMMER on the clinical aspects of psychic and nervous diseases,[14] which are before us, contain some excellent articles and some material which is less good. It is a disadvantage to publish such a series as this, for the appearance of the several parts is so irregular that the interest is frequently lost before the volume is completed. We cannot discuss the merits of each article separately, partly because their number is large and partly because they form only a fraction of a whole, the remainder being still in the press. The end of the fourth volume contains *inter alia* some trite deliverances on dipsomania and psychic epilepsy by Römer. In the first part of the fifth volume is a good article by Becker on the methods of testing intelligence, an interesting description of the transactions of the Psychiatric Section of the last International Medical Congress by the editor, and several other articles. The fourth part of the same volume is valuable on account of an article by Professor Sommer on the theories in connexion with marriage between relatives and the consequent limitation of ancestors in human beings and animals. The first part of the sixth volume deals chiefly with the associations in maniacs, etc., and the most prominent author is Killian. The second part of this volume contains some good articles, including one by Margulies on hystero-epilepsy. In the third part are articles on the methods of psychological examination by Sommer, on the methods of testing the intelligence by Mikulski, and on the psychological profile by Rossolimo.

[13] *L'Internationalisme Scientifique (Sciences pures et lettres)*. Par P. H. Eijkman, Médecin à la Hage. Avec un avant-propos du Professor P. S. Reinsch Publication du Bureau Préliminaire de la Fondation pour l'Internationalisme. The Hague: Van Stockum and Son. 1911. (Roy. 8vo, pp. 120. Fr. 3.)

[14] *Klinik für psychische und nervöse Krankheiten*. Edited by Professor Dr. Robert Sommer. Halle: Carl Marhold. Vol. iv, part 4, 1909; vol. v, parts 1 and 4, 1910; vol. vi, parts 1, 2, and 3, 1911. (Mk. 3 each vol.)

Nova et Vetera.

IN PRAISE OF THE PHYSICIAN.

IN an earlier article[1] an attempt was made to set forth proverbial medicine in dispraise of the doctor, and no difficulty was met with in finding troops of adages in which the medical man was made to appear in a bad light. He was an atheist in two cases out of three; when his treatment was successful, it was to Nature and not to the doctor that the credit was due; diet and quiet were of more worth than he; nay, there was more danger from the doctor than from the disease; he was a fool; he suffered sometimes from the very maladies which he professed to cure; and, worst of all, in the end he died just like other people, perhaps a little earlier too.

When, however, search is made for proverbs in praise or in appreciation of the medical man, the searcher meets with a most humiliating disappointment—humiliating, that is, if he be himself a doctor or the friend of the doctors; for apparently there are no such proverbs. Iceland, in common with Ireland, enjoys the privilege of being free from serpents, and medicine in common with law seems to suffer under the discommendation of having no proverbs of commendation, far less of acclamation, laudation, or of benison. In proverbdom there is no territory, not even the smallest plot of ground, set aside for the cultivation of those delightful plants and flowers of common speech, the appreciative adage and the complimentary saying.

The absence, or at any rate the extraordinary paucity, of proverbs in praise of the doctor is somewhat disconcerting. The profession may hold its head haughtily in the air and agree to disregard this tiny note in the general concert of appreciation which pleasingly fills its ears. But no, this will not do; like the leader of the orchestra in which the piccolo player from modesty or fancied unimportance was silent, the medical man at once feels the lack of the delicate flute-like tones. Or the physician may say of those who failed to bring him the little attention of a eulogistic proverb what James Boswell affirmed of the "cold-blooded and morose mortals who disliked his book" (on Dr. Johnson), that he would not for a thousand pounds have their temper.

Whether, however, it be treated with disregard or with silent contempt, this lack of laudative proverbs is a sore thorn in the side of the self-esteem of the profession, pricking and jagging in a really most irritating manner and calling aloud for some lenitive to mitigate the hurt that pride has had. One wonders if there be no means of collective investigation whereby some pleasing proverbs could not be found in some out-of-the way place or little-known book? Might not one do, as it is said Sir Walter Scott did when he wished to have appropriate quotations for the headings of his chapters, write them himself, and say they came from "old plays"? One might easily construct a few fairly satisfactory ones, such as "Who is so dear as the doctor?" "As the doctor goes out through the door the drugs may depart through the window"; "A doctor in time may save you from crime"; "Dop to the doctor and give him good e'en," or "As sure as a surgeon."

Apart, however, from the pleasantries of the preceding paragraph, the question does seem to demand some sort of answer. Why are there no commendatory proverbs about doctors? To attempt to find a solution of this problem is really to go to the very roots of proverbiology. It suggests other questions: Why, for instance, are there proverbs on one set of circumstances rather than on another, why on one class of people more than on another, and why on the less commendable qualities rather than on the praiseworthy? A partial answer has been given already in the article dealing with proverbs in dispraise of the doctor, where it was shown that the unpleasant aspects of an illness are apt to impress themselves more permanently on the patient's mind and memory than the pleasant, which are also the scarcer. The doctor suffers the damage due to his association with a trying or painful experience in the patient's life, and the latter is content to forget all about it after it is well over, and to try to re-establish the belief in the innate healthiness and

[1] BRITISH MEDICAL JOURNAL, December 2nd, 1911.

strength of his own constitution which he had held before his attack by disease. So the patient lays that flattering unction to his soul that it was his own recuperative powers that saved him, and that perhaps the medical man after all did very little for him. There is also another and a simpler reason, and that is the child's one that the doctor's coming is associated with the taking of nauseous drugs, with restricted liberty, and with preparatory threats.

Whilst, however, proverbs in praise of the doctor are wanting, or so few as to be almost undiscoverable, some appreciative phrases are not altogether lacking, and literature, both ancient and modern, abounds in eloquent expressions of the gratitude and regard felt by authors towards their medical attendants. There is, for instance, that high compliment paid to the profession when a member of it was called *Manus Dei*. Here is a passage from Burton's *Anatomy of Melancholy* bearing and illustrating this phrase: "Next therefore to God in all our extremities (*for of the Most High cometh healing*, Ecclus. xxxviii, 2) we must seek to, and rely upon, the Physician, who is *Manus Dei* [the Hand of God], saith Hierophilus, and to whom He hath given knowledge, that He might be glorified in His wondrous works. With such doth He heal men, and taketh away their pains" (Ecclus. xxxviii, 6, 7). Continuing to quote from Ecclesiasticus, Burton says: "When thou hast need of him, let him not go from thee. The hour may come that their enterprises may have good success" (verse 13). Burton, however, knows about quacks: "It is not therefore to be doubted that, if we seek a Physician as we ought, we may be eased of our infirmities, such a one I mean as is sufficient, and worthily so called; for there be many Mountebanks, Quacksalvers, Empiricks, in every street almost, and in every village, that take upon them this name, make this noble and profitable Art to be evil spoken of, and contemned, by reason of these base and illiterate artificers; but such a Physician I speak of as is approved, learned, skilful, honest."

To Burton, then, we are indebted for this fine phrase (*Manus Dei*) dug up out of Hierophilus, but he could not leave the profession with nothing but praise, and he went on to speak of "the hungry Chirurgeon who often produces and wire-draws his cure, so long as there is any hope of pay," and of the physicians, who, to get a fee, 'will give physic to every one who comes, when there is no cause, and who do so *irritare silentem morbum* (as Heurnius complains) stir up a silent disease." Nevertheless, we thank Robert Burton for his definition of physicians as "God's intermediate ministers."

Leaving the Apocrypha, Hierophilus, and Burton, we turn to the greatest man of the first century of the Christian era and to his age-defying description of his doctor. Surely never was there a more laconic appreciation of a medical man's services than St. Paul's four words about Luke; and yet the phrase is so warm, so fitting, so touching, so true, that it has established its place for all time as the highest meed of praise which a patient can confer upon his physician. We can be sure that not without emotion were these words written, falling like a glittering tear on Paul's parchment as he penned his signature to the epistle to the Colossians. Λουκᾶς, ὁ ἰατρὸς ὁ ἀγαπητὸς (Luke, the physician, the beloved!). Our English Authorized Version worthily rendered the phrase, "Luke, the beloved physician," and the Revised Version could not improve upon it; but, as a matter of fact, the translation might very well have been "dear," "dearly beloved," or "well beloved," for in all these ways is the Greek word ἀγαπητὸς rendered in our New Testament. Long ago Luther, in his *Table Talk* (428), said: "St. Paul was very rich and flowing in words; one of his words contains three of Cicero's orations, or the whole of Isaiah or Jeremiah"; and Luther's estimate, although carrying the impress of the less carefully guarded language of easy conversation, is admirably exemplified in the instance to which reference has just been made. Not only in Greek and in English, but in other European tongues also, the phrase is striking, and lends itself readily to translation without losing its warmth and appropriateness. In German it becomes *Lucas, der Arzt, der Geliebte* (which is very close to the Greek); in Dutch it is *Lukas, de medicijnmeester, de geliefde;* and in Danish *Lucas, Laegen, den Elskelige.* The Vulgate translates it briefly, *Lucas medicus charissimus*, and the French amplifies it a little, giving *Luc, le médecin, qui m'est très-cher.* The Spanish is somewhat bald, *Lucas, el médico amado;* whilst the Portuguese is warmer, *Lucas Medico, nosso carissimo irmao.* In all these linguistic garbs the words have still an abundant vitality and arrest the reader's attention. To Paul, the lonely man, getting lonelier as he became Paul the aged, Luke must often have brought not only light (as his name signified), but also healing, comfort, and literary sympathy and appreciation; and the great Apostle has drawn out of an overflowing heart the four burning words in which he spoke (so far as they could be spoken) his gratitude and affection.

In modern times there have been many appreciations of the physician both in verse and prose. Everyone, for instance, knows Henley's lines on Lord Lister when he was in the Edinburgh Royal Infirmary; but Crabbe's verses in *The Village* may be less familiar, whilst they are no less appreciative and indeed contain phrases which possess almost proverbic force. To the profession he sings:

> Glorious your aim,—to ease the labouring heart,
> To war with death, and stop his flying dart;
> To trace the source whence the fierce contest grew,
> And life's short lease on easier terms renew;
> To calm the frenzy of the burning brain,
> And heal the tortures of imploring pain;
> Or, when more powerful ills all efforts brave,
> To ease the victim no device can save,
> And smooth the stormy passage to the grave.

From the other side of the Atlantic, too, the beautiful lines come over to us in which Whittier calls upon his young medical friend and upon all of us who are of like spirit with him:

> Beside the unveiled mysteries
> Of life and death go stand,
> With guarded lips and reverent eyes,
> And pure of heart and hand.

For,

> The holiest task by Heaven decreed,
> An errand all divine,
> The burden of our common need
> To render less is thine.

In prose there are many appreciations of the profession, but from two authors alone will our space permit us to quote, from Carlyle and from Stevenson. The reader does not approach the writings of Thomas Carlyle, "the truest Diogenes of these times" as George Gilfillan called him, with any very hopeful anticipations of finding smooth sayings about doctors in them. Sarcasm, biting and caustic, he expects; denunciations, fulminations, bitter pleasantries perhaps, but scarcely smooth sayings. What is his amazement, then, to find two such passages as the following, the one a measured tribute to the profession of medicine at its best, and the other a warm appreciation of a man who truly practised it at that high level. The first of the two passages begins in grumbles and ends in growls, low mutterings of a coming storm, but in the heart of it are some sentences of quiet eulogy, very precious to the physician who is setting the highest ideal before himself:

> Medicine, guarded too by preliminary impediments, and frightful medusa-heads of quackery, which deter many generous souls from entering, is one of the half-articulate professions, and does not much invite the ardent kinds of ambition. The intellect required for medicine might be wholly human, and indeed should by all rules be,—the profession of the Human Healer being radically a sacred one and connected with the highest priesthood, or rather being itself the outcome and acme of all priesthoods, and divinest conquests of intellect here below. As will appear one day, when men take off their old monastic and ecclesiastic spectacles, and look with eyes again! In essence the Physician's task is always heroic, eminently human; but in practice most unluckily at present we find it too become in good part *beaverish;* yielding a money-result alone. And what of it if it is not beaverish,—does not that too go mainly to ingenious talking, publishing of yourself; ingratiating of yourself; a partly human exercise or waste of intellect, and alas a partly vulpine ditto;—making the once sacred Ἰατρὸς or Human Healer more impossible for us than ever!

So with high appreciation of the best in medicine, but with no kind word for the worst in it, for the pride and love of money that are in it, did the great "slayer of shams" deal with our profession in one of his *Latter-day*

Pamphlets, date, May 1st, 1850.[2] But the medical man is more grateful for another passage, written some seven years earlier,[3] where Carlyle with his heart burning within him denounces the iniquities of the Poor Law, and quotes Dr. Alison's evidence on the state of things in Edinburgh, although he himself must have known not a little at first hand of what Alison reported on:

So many hundred thousands sit in workhouses: and other hundred thousands have not yet got even workhouses; and in thrifty Scotland itself, in Glasgow or Edinburgh City, in their dark lanes, hidden from all but the eye of God, and of rare benevolence the minister of God, there are scenes of woe and destitution and desolation, such as, one may hope, the Sun never saw before in the most barbarous regions where men dwelt. Competent witnesses, the brave and humane Dr. Alison, who speaks what he knows, whose noble Healing Art in his charitable hands becomes once more a truly sacred one, report these things for us: these things are not of this year, or of last year, have no reference to our present state of commercial stagnation, but only to the common state.

Then, as if his thoughts were being directed by his allusion to this famous physician, Carlyle continues in a sentence, full of medical similes, to criticize the proposed remedy:

Not in sharp fever fits, but in chronic gangrene of this kind is Scotland suffering. A Poor-law, any and every Poor-law, it may be observed, is but a temporary measure; an anodyne, not a remedy.

Dr. William Pulteney Alison, to give him his full name, was, it is interesting to recollect, a writer of books as well as a professor of physiology and a medical man; and we remember his name with warm affection, and are grateful that he was the cause of Carlyle's so generous and kindly recognition of our profession and its true practitioners. Nor can we afford to neglect the fact that Thomas Carlyle had a favourite younger brother, John Aitkin Carlyle, who was a medical man, and also, by reason of his prose translation of Dante's *Inferno*, a literary one. In his close association with his brother Thomas in Edinburgh, John Aitkin Carlyle must have had many opportunities of speaking to him of Professor Alison, for the last named was elected to the chair of physiology in 1822, the year in which Thomas Carlyle was enabled through his appointment as tutor to a wealthy gentleman's sons to invite John to come to study medicine in the Scottish capital and to share his rooms with him. Thomas Carlyle never wrote a more generous or a more affectionate letter than that which he sent off to John in January, 1822, bidding him come to Edinburgh, for the necessary money for fees was forthcoming. "Where is the risk then, my boy Jack?" he cheerily asked. But of the close companionship thus begun, and of its influence on both the brothers, we have not time now to speak; let us gratefully take note of the fact that Carlyle paid so hearty a compliment to the medical profession and to William Pulteney Alison, his brother John's teacher.

A much more delicately and deftly expressed compliment was offered by Robert Louis Stevenson in his dedication of *Underwoods;* and it is not without quiet humour, daintily set forth:

There are men and classes of men that stand above the common herd: the soldier, the sailor, and the shepherd not unfrequently; the artist rarely; rarelier still the clergyman; the physician almost as a rule. He is the flower (such as it is) of our civilization; and when that stage of man is done with, and only remembered to be marvelled at in history, he will be thought to have shared as little as any in the defects of the period, and most notably exhibited the virtues of the race. Generosity he has, such as is possible to those who practise an art, never to those who drive a trade; discretion, tested by a hundred secrets; tact, tried in a thousand embarrassments; and what are more important, Heraclean cheerfulness and courage. So it is that he brings air and cheer into the sick room, and often enough, though not so often as he wishes, brings healing.

Then, in a paragraph in which humour and pathos are twined round the sentences and peep out from between the semicolons, Stevenson charmingly returns thanks to his doctors:

Gratitude is but a lame sentiment; thanks, when they are expressed, are often more embarrassing than welcome; and yet I must set forth mine to a few out of many doctors who have brought me comfort and help; to Dr. Willey of San Francisco, whose kindness to a stranger it must be as grateful to him, as it is touching to me, to remember; to Dr. Karl Ruedi of Davos, the good genius of the English in his frosty mountains; to Dr. Herbert of Paris, whom I knew only for a week, and to Dr. Caissot of Montpellier, whom I knew only for ten days, and who have yet written their names deeply in my memory; to Dr. Brandt of Royat; to Dr. Wakefield of Nice; to Dr. Chepmell, whose visits make it a pleasure to be ill; to Dr. Horace Dobell, so wise in counsel; to Sir Andrew Clark, so unwearied in kindness; and to that wise youth, my uncle, Dr. Balfour.

With exquisite grace, Stevenson adds: "I forget as many as I remember; and I ask both to pardon me, these for silence, those for inadequate speech"; and he brings his dedication to a close with a special expression of gratitude to Thomas Bodley Scott of Bournemouth:

Will he accept this, although shared among so many, for a dedication to himself? And when next my ill-fortune (which has thus its pleasant side) brings him hurrying to me when he would fain sit down to meat or lie down to rest, will he care to remember that he takes this trouble for one who is not fool enough to be ungrateful?

Stevenson's dedication is, indeed, a radiant gem of praise in a matchless literary setting; it would be hard to find its equal among the many other kindly sayings respecting the profession and the men who practise medicine, although Ruskin has sentences almost as fine and warm, and in fiction Anthony Trollope's proudly-humble Dr. Thorne of Greshamsbury and Ian Maclaren's doctors hold up their heads among the throng. But enough has been said to prove that if the profession has been left without the added glory of complimentary proverbs passed down to it from the past, it is not poor in appreciations coming from the highest literary sources. It can never forget that in its ranks stood Luke, the beloved physician, and that the humblest practitioner may be, if he will, *Manus Dei*.

[2] *Latter-day Pamphlets*, No. V, Stump-orator
[3] *Past and Present*, Bk. I, c, 1, Midas.

GASWORKS PITCH INDUSTRIES AND CANCER.

IN the BRITISH MEDICAL JOURNAL of January 4th some account was given of the investigations made by H. C. Ross and J. W. Cropper into the nature of the relation between gasworks pitch and cancer. These two investigators have continued their researches in the laboratories of the John Howard McFadden Researches, and have made the additional observation contained in the following report, which is ready to be presented at the Home Office Inquiry on the subject which is to meet next week:

AN INVESTIGATION OF THE AUXETICS AND KINETICS IN COALS FROM VARIOUS SEAMS.

Chimney-sweep's cancer in the workmen employed at the briquette (patent fuel) manufactories seems only to supervene when the predisposing conditions of swarthy skin, warts, and ulceration have been going on for some time. These predisposing conditions are caused by the pitch which is a constituent (from 5 to 10 per cent.) of the briquettes. It is ground up, and the men's skins become covered with the dust either from the air or from actual handling. But it is only one class of pitch in which this action has been observed. Coal-tar pitch is generally dangerous; blast-furnace pitch is harmless.

In the present paper we propose to describe a continuation of our experiments in this subject, and in particular those made with a view to elicit the reason for this difference between the two forms of pitch.

In the BRITISH MEDICAL JOURNAL of January 4th, 1913, a leading article described the incidence of swarthy skins, warts, and epithelioma occurring in the workmen engaged in tar distilleries and briquette manufactories. Some remarks on the subject which we have already published[1] were also mentioned. We believe that the skin conditions are due to the presence of substances—auxetics and kinetics—which have been detected in gasworks tar

[1] *The Problem of the Gasworks Pitch Industries and Cancer* (London: John Murray, 1912.

and pitch. Blast-furnace tar and pitch, on the other hand, only contain a trace of auxetic and no kinetic at all. Both gasworks tar and pitch give rise to the pathological lesions; neither blast-furnace tar nor pitch have this action. The question arises, therefore, as to why the gasworks tar and pitch should contain large quantities of auxetics and kinetics, when the blast-furnace tar and pitch do not.

Pitch is the residue of the distillation of tar; tar is a product of the dry distillation of coal. Any substances which are not volatile below the temperature of 300° C. will be found more concentrated in pitch than in tar. In the tar they are found in a more concentrated state than in coal. Briquettes do not contain tar, but are composed of a mixture of pitch and coals, and the briquette makers suffer a great deal (about 90 per cent. have swarthy skins, which apparently is an early stage of the other conditions); tar distillers only continuously handle the tar and the pitch more or less intermittently, and they suffer less; coal miners apparently are not liable to the skin lesions at all, although a few isolated cases of chimney sweep's cancer (hitherto not attributed to the coal dust) have occurred amongst them. Therefore pitch is more dangerous than tar, and tar is more dangerous than coal. But outstanding beyond these facts is the indisputable evidence that those who work with either pitch or tar derived from the blast furnace do not suffer in any way. It is the tar derived from the gasworks and the pitch made from it which are the dangerous commodities, and probably that also from the coke ovens.

Although the auxetics and kinetics in tar and pitch have not yet been actually isolated chemically,[2] we know by experiment that they are not volatile below a temperature of 320° C., which will explain why they are more concentrated in pitch than in tar. But both forms of pitch are the residue from a similar process of distillation, yet one form is dangerous and the other is not.

There are two explanations to offer for this difference. One is that, although both forms of pitch are made in a similar way, the tar derived from the blast-furnace comes over at a lower temperature[3] than gasworks tar, and it has been suggested that the auxetics and kinetics may be produced in the latter owing to some chemical process occurring at the higher temperature of distillation. Another explanation is that nearly all the blast-furnace tar is made from a different type of coal (Scottish splint coal) than gasworks tar, which is a product of the distillation of ordinary bituminous coal. Scottish splint coal does not soften when heated. Ordinary bituminous coal cannot be used in the blast furnaces because it softens and cakes into masses at the bottom of the furnaces. Scottish coal does not cake into masses but retains its form in the furnace.

The first explanation that the auxetics are high temperature products is rebutted by the fact that coal tar produced at a comparatively low temperature of carbonization contains auxetics, whereas blast-furnace tar (which is also a low-temperature product) is comparatively free from auxetics. The second explanation, when these former experiments were done, seemed more reasonable, because auxetics had been detected in ordinary house coal and in petroleum.

Therefore the investigation of coal has been continued. Coals from various seams have been tested, and there seems to be no doubt that the auxetics and kinetics in tar and pitch are not manufactured during the process of distillation, but are derived from the original coal from which those substances are made. These results are tabulated below, and they also show that the difference between blast-furnace tar and pitch and gasworks tar and pitch is probably due to the different varieties of coal employed in their manufacture and not to the temperature of distillation of the coal.

The method of testing has already been described in detail. Various quantities of watery "extracts" of pitch, tar, or coal, as the case may be, are mixed up with "coefficient jelly," and white blood cells are placed on the jelly film. If after ten minutes' incubation at 37° C. the majority of the lymphocytes show division figures, the extract is labelled as containing auxetic. If at room temperature they show exaggerated amoeboid amounts, the extract is labelled as containing kinetic. It is noteworthy, however, that when testing pitch or tar it is only necessary to employ 1 per cent. extracts, but when testing coals 10 per cent. extracts are required, which shows how much more concentrated the auxetics are in tar and pitch than they are in coal.

[2] An attempt to isolate them is now being carried out at the Lister Institute.

[3] Although a higher temperature is reached in the blast furnaces the tar comes over at a lower temperature than does gasworks tar.

Samples of Coal.

No.	Source.	Auxetic.	Kinetic.
1	Dunfermline splint seam (Fife) ...	Yes	Yes.
2	Splint seam (Haddington)	No	Yes (feeble).
3	Diamond seam (Edinburgh)	Yes (poor)	No.
4	Splint seam (Edinburgh)	Yes	Yes.
5	Little splint seam (Fife)	No	No.
1	Anthracite	Yes	No.
2	Second-rate anthracite	Yes	No.
3	Dry steam coal	No	No.
4	Best steam coal	Yes (poor)	Yes.
5	Highly bituminous coal	Yes	Yes.
6	Curly shale	No	No.
7	Dunnet shale	No (suspicious)	No.
8	Fells shale	No	No (suspicious).
9	Dunnet shale	No	No.
10	Grey shale	No (suspicious)	No.
11	Broxburn shale	No	No.
12	Upper grey shale	No	No.
13	Main coal from Durham	Yes	Yes.
14	Best hard coal from Top Hard Seam, Notts	Yes	No.
15	Thick coal of South Staffordshire ...	No	Yes.
16	Coal from seam in Gloucestershire ...	Yes	Yes.
17	Cannel	No	No.
18	Bottom softs	Yes	Yes.
19	Hards	No	No.
20	Top softs	Yes	No.

Samples of oil shale from the various seams worked at the mines, Linlithgow (Nos. 6–12).

Samples from one colliery, Yorkshire. Nos. 18, 19, 20 are from one seam (Nos. 17–20).

Remarks.—We have omitted the names of the actual collieries. As regards auxetic, No. 5 (second series) appears to be the more effective, then come Nos. 1 and 18 in that order. As regards kinetic, No. 16 is the most effective, then No. 5. Therefore No. 5 seems to be the most dangerous of all.

Mr. Poole, of the Mines Department at the Home Office, comments as follows:

In addition to No. 5, Nos. 13, 16, 18, and 20 (second series) would be bituminous coals, and No. 4 (best steam coal) would be semi-bituminous. From No. 16, briquettes used to be made some ten to fifteen years ago. No. 5 of the Scotch samples (little splint seam) is from a different bed of coal from No. 1, in which there was both auxetic and kinetic. No. 17, in which there was neither auxetic nor kinetic, is, at the mine from which it was obtained, of an oily shale nature corresponding somewhat to samples 6 to 12, in none of which also is auxetic or kinetic found.

At our request, all the coals were sent to us (from the Mines Department Home Office, through Dr. Legge, His Majesty's Medical Inspector of Factories) each merely distinguished by a number, so that even if we were biassed in favour of one form of coal, we were not in a position to know which that coal was until we had compared the results of our experiments with the key to the numbers, which was kept by Dr. Legge.

It will be seen, therefore, that, judging by the presence of both auxetic and kinetic, the soft or bituminous coals are the ones which give rise to the dangerous tar and pitch. And this result is borne out by the incidence of the pathological lesions amongst the workmen. Scottish splint coals and sometimes many hard ones produce harmless commodities. Cannel is a coal of recent origin; shale is the mineral from which oil is distilled in Scotland. There have been a few isolated cases amongst the men at the shale-oil works. The difference between various portions of the same seam in the one colliery is interesting, but is apparently quite consistent with the results here expressed.

An important point suggested by this investigation is whether it would be feasible for gasworks which now carbonize only highly bituminous caking coals to mix with the latter a percentage of harder and less highly bituminous coals. Such a procedure would in all probability reduce the incidence of the pathological conditions amongst the workmen at the briquette works and tar distilleries. But, in addition to a difference in the quality of gas and coke, the question of extra freights

comes in, especially in those large gasworks which use seaborne soft coal. The importation of other coal might be a serious matter to them. We may state that at a recent deputation of tar distillers to the Chief Inspector of Factories at the Home Office the distillers were very adverse to our proposal of washing the auxetics and kinetics out of the tar. They said that such a process would cause great difficulty and expense in separating the water from the tar. Therefore we now publish this suggestion of trying the mixture of a certain percentage of hard coals at the gasworks. Of course, it would not be so useful as elimination of auxetics, but it might be considered as an alternative for experiment, provided suitable hard coals can be found for gas-producing purposes.

In the meantime we hope that medical men practising in the colliery districts will report cases of swarthy skins, warts, or ulceration occurring in the miners. Should any occur, it is of importance to know by which seams the cases are caused.

In conclusion, the question as to why hard coals, especially Scottish splint coals, should have less auxetic and kinetic than the bituminous ones is really a problem for the geologist and chemist. We are also interested in the matter in connexion with our own working hypothesis, about which there is some strong evidence.[4] We believe that cell reproduction is caused by auxetics, which are specific agents set free by cell death. These agents occur after cytolysis, both in the animal and vegetable kingdoms. Coal, in a way, is also a product of cytolysis; and it is interesting to think that these products, after having lain buried for centuries, are dug up, subjected to an elaborate process of artificial distillation, are converted into briquettes, and then give rise to cell reproduction in the shape of swarthy skins and warts, leading to epithelioma in the workmen employed at the factories.

Our acknowledgements are due to Mr. W. J. Butterfield, M.A., F.I.C., Assoc. Inst. of Civil Engineers, to Dr. Legge (His Majesty's Medical Inspector of Factories), and to Mr. Poole (His Majesty's Inspector of Mines), for advice, and for assistance in obtaining the samples of coal.

THE AFTER-CARE ASSOCIATION.

THE annual meeting of this association, formed in 1879 by the late Rev. Henry Hawkins, for many years chaplain of the Sussex County and Colney Hatch Asylums, for the purpose of facilitating the readmission into ordinary social life of poor persons discharged recovered from asylums and hospitals for the insane, was held on February 25th at the house of the Medical Society of London. Sir JAMES MOODY, Medical Superintendent of Cane Hill Asylum, presided over a large gathering, which included many ladies.

The adoption of the report was moved by Sir GEORGE SAVAGE, who pointed out how relapses were prevented by the benevolent operations of the society.

The BISHOP OF CROYDON, who seconded, remarked on the practical Christian character of the assistance the society gave to poor and often helpless convalescents from mental disease in rehabilitating them for work.

The election of vice-presidents, council, and officers was moved by Dr. THOMAS (A.M.O. at Hellingly Asylum), and seconded by Dr. NEEDHAM, who spoke of the great value placed upon the work of the society by the Lunacy Commission.

Dr. C. HUBERT BOND then read a paper on After-care in Cases of Mental Disorder, and the Need for Extending its Scope to the Case of Patients leaving the Asylums "on Trial" as to Recovery. He pointed out that while all the persons discharged from asylums in England and Wales (about 7,000 a year) must of necessity benefit by suitable after-care, for nearly a quarter of them it was urgently required. Not only was that after-care demanded on humanitarian grounds, but, by reason of its preventive power in respect of relapses, it might be fairly regarded as being economically worthy of generous support. To be effective, after-care must be organized, and its organization should aim at branches of the association, which should at least be as many as there were local authorities, either acting alone or in combination for lunacy purposes. It would, he said, facilitate the work of the association if its rules could be so modified as to permit its executive to commence, in certain cases, such work during a period while the patients were away from the asylum "on trial," and to further permit such patients being received while "on trial" into one of the association's cottage homes. He also advocated that the Visiting Committee of Asylums should be urged more frequently to take advantage of the provision in the Lunacy Act whereby patients who appeared to have recovered might, instead of being at once fully discharged, be allowed out "on trial," and might during such period be granted an allowance not exceeding the cost of their maintenance in the asylum. That practice, which was habitually adopted by certain committees, was of the utmost value to the patients, and by its adoption early relapses were materially prevented. It would enable a weekly sum to be paid that association, which would rather more than half meet its expenditure on patients temporarily boarded at its cottage homes.

Sir JAMES MOODY raised the point whether it would be legal for asylums to make payments towards the society for the care of patients "on trial"; but Mr. A. H. TREVOR (a legal Commissioner in Lunacy) replied that under the circumstances mentioned by Dr. Bond such payments would not be illegal.

Drs. HELEN BOYLE, LORD, BOWER, PERCY SMITH, RAYNER, and the BISHOP OF CROYDON and Mr. ROXBY took part in the discussion, the last speaker strongly advocating the extension of the society's operation to cases "on trial."

THE BRADFORD ANTHRAX INVESTIGATION BOARD.

SUMMARY OF INVESTIGATIONS.

THE Anthrax Investigation Board for Bradford and District issued its seventh annual report for the year ending October 31st, 1912. The objects of the Board are: (1) The investigation of anthrax generally, (2) to determine more precisely the classes of wool and hair in connexion with which the danger of anthrax arises, and (3) the discovery of further means of prevention. The area of its operations has been confined to the worsted and woollen industries of the West Riding of Yorkshire. The value of the present report is increased by the inclusion in it of an analysis of the observations in the 88 cases of anthrax notified to the Board since 1905 as arising from the use of textile material in the district. The analysis had been made with a view to determining as far as possible the relative danger of infection.

During the year, 1,258 samples of wool, mohair, etc., were tested for the presence of anthrax spores. Of these, 1,038 were blood stained (190 only slightly). Anthrax spores were discovered in 84 samples, and of these 24 were not blood stained. The hope expressed in a previous report that it might prove possible to say, "No blood, no anthrax," must therefore be given up; nevertheless, the presence of blood should always be regarded as a danger signal. Of alpaca, 206 samples were taken (196 blood stained), and in no case could anthrax bacilli be cultivated. From 268 samples of skin van mohair (205 blood stained) 35 separate cultivations were obtained; 8 samples contained no blood, and only in rare instances could the amount of blood be called a clot. The fellmongering process used was the "wet" process; by it the blood clots would be partially dissolved and the anthrax spores disseminated among the previously non-infected material. "Skin" wool and "skin" mohair may be classed under three heads: (1) That which has been "clipped" from the skin of the sheep or goat; (2) that which has been "pulled" in the usual (wet) fellmongering lime process; (3) that which has been "pulled" in the chemical or dry process, or has been "pulled" dry from the rotten or rotting pelt. That contamination can take place in the "wet" process is obviously possible; to what extent, if at all, it takes place in either of the dry processes is not yet known, but the blood clots found after "the clipping" and the "dry" pulling process were more numerous and heavier than those found after the "wet" pulling process, with consequently more concentration of the danger if the anthrax spore were present. In any case, the anthrax spore of contamination can be killed more readily than the spore imbedded in the blood clot. With regard to East Indian wools, anthrax was found seventeen times in 132 samples. Excepting in one

[4] For example, see article by Mr. Drew on Induced cell reproduction in the protozoa, *Nature*, February 20th, 1913.

instance, all the cultivations from materials without trace of blood were isolated colonies, showing apparently that the material had been contaminated. This contamination would seemingly take place when the wool or hair is subjected to some "wet" process, such as washing or lime fellmongering. It is very doubtful if contamination takes place in the dry state. If the washing be done in running water or a lake, infection is evidently less likely to take place than if the material be "tub washed." In the latter process the releasing and spreading of the anthrax spore in such a restricted space seems calculated to ensure contamination. It would be interesting to know to what extent "tub washing" of wools is in vogue in India. Anthrax was cultivated twenty-four times in 545 samples of Persian, and six times in 84 samples of mohair other than "van"; in both these classes the spores were only found in blood-stained samples.

A satisfactory germicide, capable of killing the anthrax spore without injury to the fibre, has not yet been discovered. Steaming of blood clots will kill anthrax spores in about fifteen minutes when the wool is in a loose state, but the difficulties in the way of disinfecting wool in bulk by steam make the method impracticable for ordinary use. Of chemical methods, experiments made with Schattenfroh's and Seymour-Jones's processes have been disappointing; the hydrochloric acid in the one process and the formic acid in the other being neutralized by alkalis in the wool and tap water. Blood clots can in most instances be softened by bacterial action in twelve to eighteen hours at 37° C. Bacteria possessing this property are contained in the wool itself. It would seem that clots so softened are but slowly hardened by the subsequent addition of germicides, such as formaldehyde or the higher phenols.

An analysis has been made of the 88 cases of anthrax notified to the Board since 1905 with a view to determine the relative danger of infection. It appears that mohair and Persian have been the most frequent carriers of anthrax. Russian camel hair is probably the other scheduled material the most likely to have been a carrier. Some suspicion attaches to East Indian goat (possibly all "goat") and to East Indian wool. Alpaca has probably been harmless. In many cases the source of infection was doubtful, and some cases are inexplicable. Cases arising from the shorter sorts occurred more frequently in the processes of manufacture than in the handling of the raw material; in the longer sorts the reverse was the case.

The greater number of cases occur, as was to be expected, amongst the Commission combers handling the lowest and the more dangerous sorts, but cases occur in factories where combing and the subsequent processes are carried on. Some factories, though continuously using some scheduled materials, have never had a case of anthrax, and in others cases are rare. No instance is on record in this district of the early diagnosis of the internal form, and the application of remedies for the external form is often delayed. The use of Sclavo's serum, injected intravenously and in sufficiently strong doses, has proved beneficial.

In view of these results the present regulations for wool sorting and wool combing are considered to require revision. When they were drawn up, dust was thought to be the means whereby anthrax was spread, but now that the source of danger is known to lie in the blood clot, regulations should be based upon the underlying principle of eradicating this source, and of preventing danger of infection after sorting and washing processes. But no regulations will prove satisfactory that do not provide for some adequate disinfecting process for those sorts most likely to contain the anthrax germ. Every inducement should be given to workers of scheduled materials to throw out all blood-stained material, not only for their own safety, but more especially for the safety of workers in subsequent processes; but, until further progress has been made in the effort to find satisfactory disinfectants and a satisfactory disinfecting process, the Board deprecate any attempt to recast the present rules.

Seventeen cases have occurred during 1912; 2 were females and 15 males; 3 were internal cases, 14 external. The deaths numbered 5, 3 of the internal, 2 of the external type, 1 of these being probably unique as to the point of entry of the virus, namely, between the left tonsil and the larynx. Four of the cases which got well were severe, and probably owed their recovery to the use of Sclavo's serum. With one exception all the cases had come into contact with either mohair or Persian, and it is quite possible that these sorts were responsible for all the 16 cases.

Little or no improvement is yet visible either in the number of cases recorded or in the percentage of the death-rate, although there is distinct encouragement in the number of severe attacks which have yielded to modern treatment.

SCIENCE NOTES.

IN a lecture at the Royal Institution, not yet published, and in a letter to *Nature* of February 13th, Sir J. J. Thomson has described some experiments which are interesting intrinsically, and also as affording another explanation of the observations of Professor Norman Collie and Mr. Patterson (BRITISH MEDICAL JOURNAL, February 8th, p. 304, and February 15th, p. 360). They, it will be remembered, found that in a vacuum tube containing sufficient hydrogen to conduct an electric discharge helium made its appearance after sparking for some time, and that in another tube containing a little oxygen, with which the first tube was surrounded, neon and helium appeared, the formation of neon being apparently conditional on the presence of oxygen. They suggested three possible explanations: (1) The transmutation of one or more of the elements in the glass or electrodes into helium or neon; (2) the transmutation of hydrogen into helium and neon by the electric discharge; or (3) the conversion of the energy of the electric discharge into these two gases. Collie and Patterson, who were supported by Sir William Ramsay, appeared to be in favour of the second of these hypotheses. Sir J. J. Thomson's evidence is in favour of a hypothesis allied to, but not quite identical with, the first of Collie and Patterson. Using the method of positive rays, which is more sensitive than spectrum analysis, and furnishes more definite information, he has during the last two years found evidence of the existence of a gas with the atomic weight 3. This gas was frequently accompanied by another gas with atomic weight 20, which is the atomic weight of neon. There seemed to be no obvious connexion between the appearance of either and the nature of the gas that, at very low pressure, was used to fill the tube in which the discharge took place. Experiments were then directed to discovering the circumstances which favoured the production of the gas with atomic weight 3, called provisionally X_3, and to ascertain whether it was triatomic hydrogen produced by the discharge, or a new element. The second question does not seem to have been definitely answered. The conditions which led to a considerable production of X_3 generally gave rise to the appearance of helium and neon. The amount of the two latter might be very small, and mere traces might be accompanied by large quantities of X_3. In most of the experiments this gas was produced by bombarding platinum with kathode rays. The kathode was curved, and thus focussed the rays on to a table on which the platinum was placed. After bombardment on one day, the gases were drawn off into a testing tube; the line due to X_3 was very strong, and those due to helium and neon conspicuous. The gases after a second day's bombardment were the same, and there was no appreciable diminution. After a third day the X_3 had diminished considerably, the other two perceptibly. After a fourth day's bombardment the lines of X_3 and helium were barely visible, and that due to neon was not perceptible. When old lead was bombarded X_3 appeared in considerable quantities until the sixth day, when the experiment was stopped, while helium ceased to be perceptible after the second day. Sir J. J. Thomson believes that the X_3 is expelled from the metal by the bombardment, and that more came off from the lead than from the platinum, because the lead was melted, so that fresh portions were continually being exposed, whereas the platinum did not melt. In another experiment performed in a different way—by an arc discharge between iron wires in hydrogen at a comparatively high pressure—X_3, helium, and neon were found on two successive days. On the third day, using oxygen, a trace of X_3 was detected, but no helium or neon. On the fourth day, still using oxygen, no one of the

three gases was detected. This looked as though the gases had been produced by the arc passing through hydrogen, but when the oxygen was completely replaced by hydrogen, the arc gave no one of the three gases. When the old iron wires were replaced by new and the arc passed, the three reappeared. This experiment gave strong support to the conclusion that the gases were in the terminals to begin with, were removed from them by the long continued sparking, and were not produced *de novo* by the arc. This explanation, though less revolutionary than the hypotheses of transmutation of matter or its origin from the energy of the electric discharge, presents difficulties of its own. One is how the gases get into the metals. Thomson found none in lead just precipitated, and says that X_3 "does not appear to occur to any appreciable extent in the atmosphere." Another is that, if the gases pre-exist in the metals, having somehow made their way into them, they must be held there with extraordinary tenacity. That they cannot be expelled by heating appears to be shown by an experiment in which Thomson kept lead in a quartz tube boiling in a vacuum for three or four hours until all but a quarter of the lead had boiled away; in the gases given off neither X_3 nor helium could be detected. The hypothesis he suggests in a tentative way is that they may "represent the partially abortive attempts of ordinary metals to imitate the behaviour of radio-active substances," but that, "whereas in these substances the alpha particles and the like are emitted with such velocity that they get clear away from the atom, in ordinary metals they have not sufficient energy to get clear, but cling to the outer parts of the atom, and have to be helped by the kathode rays to escape."

LITERARY NOTES.

GERMANY is the land of *Rundschaus* and similar useful serial compendiums of scientific work. A new *Zentralblatt* series has just appeared, published by Mr. Julius Springer of Berlin, and edited on similar lines to its well-known namesakes. We have received the *Zentralblatt für die gesamte Gynaekologie und Geburtshilfe sowie deren Grenzgebiete* and the *Zentralblatt für die gesamte Chirurgie und ihre Grenzgebiete*. The first number of both appeared on February 25th, 1913. The surgical *Zentralblatt* is edited by Bier (Berlin), Frh. von Eiselsberg (Vienna), Hildebrand (Berlin), Köhler (Berlin), Küster (Berlin), de Quervain (Bâle), and Schmieden (Berlin), directed by C. Franz of Berlin. The gynaecological and obstetrical *Zentralblatt* is edited by Beuttner (Geneva), Döderlein (Munich), Ph. Jung (Göttingen), Krönig (Freiburg), Menge (Heidelberg), Pankow (Dusseldorf), Wertheim (Vienna), and Zangemeister (Marburg), under the direction of Runge (Berlin) and Zangemeister. This new *Rundschau* promises to be an excellent work of reference, and the first numbers, to which we referred above, include full notice of foreign as well as German works and papers.

We have to apologize for the failure to notice much earlier *A Shakespeare Glossary*,[1] by C. T. Onions, but the first impression was not altogether favourable, and we were loth to express an unfavourable opinion of any lexicon issued by the Oxford University Press, especially when the author was one of the staff of the *Oxford English Dictionary*. Greater familiarity has tended to increase the appreciation of the good qualities of the glossary, and to make its defects seem smaller. They are mainly in the direction of redundance. In the preface we are told that the aim has been "to supply definitions and illustrations of words or senses of words now obsolete or surviving only in provincial or archaic use, together with explanations of others involving allusions not generally familiar, and of proper names carrying with them some connotative signification, or offering special interest or difficulty in the passages in which they occur." The author admits, also in the preface, that he has gone very much further than this, and that many "who glance over" the pages will express the opinion that more is taken in than is necessary for the guidance of a reader of average literary knowledge, but he thinks that "a careful examination made with a view to ascertaining what proportion of the vocabulary . . . can be truly described as present-day English will prove such a criticism ill founded." This is a good defence up to a certain point, but not all the way. For instance, the whole entry under *modest* seems superfluous, as the secondary meaning of the word, which is that illustrated, is quite common in present-day English. In the opposite direction, the definition of *pigeon-livered* as "meek, gentle" is disappointing. Other examples in both directions might be quoted. Nevertheless, the book is a thoroughly sound piece of work, and we believe that the more it is used, the higher will be the respect inspired for it. For the industry which has gone to the making of its nearly ten thousand articles, to the ingenuity with which so much labour and learning has, partly by the use of conventional signs and contractions, been condensed into so little space, and for the care with which the whole has been edited, there can be nothing but unstinted praise.

The injunction to verify references is an axiom of literature and science, but to obey it ceases to be possible when the reference is to some spoken epigram which may have been variously recorded by the hearers, or when the same thought has been expressed by different speakers on different occasions and perhaps in different languages. An instance is afforded by a recent curious correspondence in the *Times*. In a leading article our contemporary had stated that it was said of some philosopher who was jesting with his disciples that he suddenly changed his manner and said, "Here comes a fool. Now we must be serious." The *Times* had prudently attributed the remark to "some philosopher," but a correspondent with more boldness assigned it to Archdeacon Paley. Yet another found the same remark in Boswell's dedication of his *Life of Johnson*, where it is attributed to Dr. Clarke, the fool in this instance being Beau Nash. Even this does not seem quite conclusive, for, as the same correspondent points out, in the *Dictionary of National Biography* the story is given on the authority of Thomas Bott, who once found the divine "swimming on a table" and on the approach of a solemn coxcomb on some such occasion heard him say, "Boys, be wise, here comes a fool." Shakespeare with his extraordinary visual memory hits off the type in one of those vivid pictures he flashes on the mental eye like a bright landscape seen momentarily from a darkened room:

> There are a sort of men, whose visages
> Do cream and mantle like a standing pond.

Or rather there are two flashlight pictures, for just before Gratiano has asked—

> Why should a man, whose blood is warm within,
> Sit like his grandsire cut in alabaster?

An illustration of the uncertainty of verification in sayings is afforded by the Latin lines quoted, in the article on proverbs regarding alcohol in the JOURNAL of February 22nd, p. 399, on the authority of Lord John Russell. Dr. Stennett Redmond sends us the following version which he says was used by Archbishop Whateley as an example of a false syllogism:

> Qui large bibit, bene dormit;
> Qui bene dormit non cogitat malum
> Qui non cogitat malum, non peccat,
> *Ergo* Qui large bibit, non peccat.

With reference to the same article, we have received the following note from Dr. R. W. Leftwich, who prudently guards himself by stating that he quotes from memory. He says: "Those who like myself appreciated very highly the articles on Proverbial Medicine, especially that in relation to the use of alcohol, may be interested in the following anecdote of Goethe. The poet had been twitted by a party of students for mixing water with his wine, and replied with the following impromptu verse:

> Wer trinkt nur Wasser wird stumm
> Das zeigen im Teich' die Fische:
> Wer trinkt nur Wein wird dumm
> Das zeigen die Herrn am Tische;
> Wer will gesund und geistreich sein
> Mischt immer Wasser mit seinem Wein.

I write from my recollection of a conversation held many years ago, for I have not seen this in print, and confess that my memory of the fifth line is so vague that I must accept the responsibility for it."

[1] *A Shakespeare Glossary*. By C. T. Onions, M.A. Oxford: The Clarendon Press. (8vo, pp. 271. 2s. 6d. net; India paper, 3s. 6d. net.)

British Medical Journal.

SATURDAY, MARCH 8TH, 1913.

THE NATIONAL INSURANCE ACT AT WORK.

We have received from the National Committee for the Prevention of Destitution, a body which was instituted for the dissemination of the views contained in the Minority Report of the Poor Law Commission, the final number of their organ, *The Crusade*, which is now to give place to a more ambitious project, a new weekly review called *The New Statesman*. The number of *The Crusade* is accompanied by a supplement written by Mr. Sidney Webb, and entitled, "The National Insurance Act at Work, what it is Effecting and where it Needs Amending," and a most interesting document we have found it.* It contains information as to the working of the Act which we have not found elsewhere, and its collection is another evidence of that passion for information for which Mr. Webb is famous. It contains also some of the most penetrating criticism of the Insurance Act which we have seen. The author, while naturally sympathetic to many of the objects of the Act, has a keen eye and an unsparing pen for its defects.

We can recommend all our readers who wish to get a bird's-eye view of the working of the Insurance Act, with all its possibilities and disappointments, to secure a copy of this supplement. It is quite easy to disagree with Mr. Webb, but no one can fail to be interested and informed by him.

When he deals with the medical benefit we find, as was to be expected, that he is dissatisfied because the provision of medical benefit is not on the lines recommended in the Minority Report. He contrasts the "fearful and wonderful network" of medical benefit with the simplicity of the public health service, very much to the advantage of the latter, and urges that it would be better to assume that as regards medical attendance all insurable persons are insured in one great national society and are in benefit, that all changes of residence should be ignored, and every person treated wherever he happened to fall sick when he presents his card to any doctor on the national panel. Under Mr. Webb's scheme every doctor who cared to accept service would be a servant of the State, either on whole or part-time salary, with, of course, the usual hierarchy of administrative officials. Mr. Webb is good enough to tell us that in the recent fight the doctors were badly organized and badly led, and displayed "quite a curious incapacity to explain their own case either to the Government or to the public perhaps because they only dimly realized what it was." It would have been kinder, perhaps, if Mr. Webb had interfered at an earlier stage and had offered to state the doctors' case for them, as no doubt he could have done much better than those personally interested. It is just probable, however, that if Mr. Webb had done so he would have been considerably surprised at the remarkable unanimity with which the profession would have rejected his proposals for its salvation. From our knowledge of the profession we make bold to say that, whatever its uncertainty as to what it wants, it is particularly clear that it does not want to be a whole or part time Government service. It is because of its strong objection to such a development that the profession accepted the panel system, which, with all its drawbacks, allows comparatively free choice of doctor by patient, and of patient by doctor, and continues that healthy emulation among doctors which is inconsistent with Mr. Webb's ideal. It may be that the profession is very misguided in taking this line, but we can assure Mr. Webb that, on the whole, the profession believes that the change from the panel system to his Government service would be from the frying-pan into the fire. Mr. Webb and his followers fail to realize that the medical profession is, on the whole, the most individualistic profession in the world. Every member of it is constantly dealing with elementary human nature, and is thrown at nearly every moment of the day on his own resources to an extent unknown probably to any other calling, and, as a result, there has been developed in the medical profession a profound mistrust of the regulations and restrictions inseparable from whole or part time service, so far as general medical practice is concerned.

Mr. Webb is of opinion that there are only two methods of payment of medical attendance which are free from the "insidious degradation that attends all contract practice"—either so much for each attendance or so much per annum. Mr. Webb remarks that the doctors would have liked the former, but "neither they nor the Chancellor of the Exchequer could find any way of protecting public funds against the unscrupulous and often collusive 'jobbing' of cases, which would have caused an unlimited drain on the Insurance funds." That method is therefore put out of court. He thinks that the friendly societies and the officials would have preferred a salaried service of whole or part timers, but the doctors, "short-sightedly enough," were up in arms against a salaried service. It is true that certain officials were in favour of a whole-time service, but there is not the slightest evidence to show that the rank and file had any leanings that way. The official mind naturally prefers this solution. It is "so simple." Whether it is "short-sighted" is another matter. With the choice limited to the panel system or the whole-time system the profession and the great bulk of the public would, we believe, prefer the former, because it leaves greater freedom to both patients and doctors, and on the whole gives greater confidence to the public. The profession as a body has spoken as strongly against the degradation of contract practice as even Mr. Webb could desire; but it is not at all clear that contract practice, when cleared of certain outstanding and non-essential evils, is more open to objection than the acceptance of a salary. In both cases the employed person accepts a fixed sum for more or less indefinite work. If contract practice is divested of the two things which have made it a byword in the profession in the past, namely, unsatisfactory remuneration and monopoly—that is, the denial of free choice on both sides—there is nothing more derogatory about it than there is in the acceptance of a fee for each visit or an annual salary. Some of the best work in the world has been done on contract, and it is taking a very superficial view to denounce the whole system uncritically, as is so often done and is

* Published by the National Committee for the Prevention of Destitution, 37, Norfolk Street, Strand, W.C., and to be obtained through any bookseller, price 2d., or direct from the Committee, post free 3d.

done in this essay. Mr. Webb is quite as emphatic as the Government was about the impossibility of an income limit. That was to be expected from him. We have always realized the difficulties in the way, which are not altogether unconnected with the necessity for securing or retaining votes. But we are just as convinced as ever that, apart from political exigencies, there is ample justification for an income limit, and cannot help thinking that if Mr. Webb and his friends were really in earnest in their denunciation of contract practice, and had thought out all that is therein implied, they would welcome a method which would go far to restrict it within necessary limits. Mr. Webb prophesies that there will be a great increase of work under the panel system, and in this, judging from the reports which have come to our notice, we are inclined to agree with him, though it is yet too soon to say to what extent this increase will be permanent. At present, owing partly to the novelty of the arrangement, people are flocking to the surgeries of the doctors with quite trivial ailments for which in the past they would have taken some domestic remedy. The result of the wide circulation of the model rules of the approved societies regulating the times at which insured persons may see their doctors and send their messages, together with the representations of the Local Medical Committees, will doubtless have a considerable effect on the situation. Up to the present these rules seem hardly to be known to the insured persons, and the Committees have not yet got into their stride. When Mr. Webb estimates that the amount of medical attendance per head of the insured population is going to be perhaps three or four times as much as that given under the old club practice, we are inclined to offer the old advice, "Never prophesy unless you know." At the present moment it is impossible either for him or for any one else to judge on this subject with anything like certainty.

Mr. Webb sees that many minor adjustments will be required to be made before the panel service can be worked with anything like satisfaction. He notes the difficulties of securing attendance for those whom none of the panel doctors will accept. Here again we think that, except in some rural areas, there will be little difficulty, though when it does arise it will be a particularly awkward one, needing all the tact and forbearance of the practitioners concerned. In the urban areas it is possible that the younger men who have yet to gain a footing in practice will be glad to take any reasonable number of patients, and they will at any rate have the satisfaction, denied to them in the past, that for all attendances on insured persons they will get some payment, even if it be inadequate. We have no doubt that during the next few months many prophecies concerning the Act will be proved to have been badly founded. Difficulties and grievances will arise which have not been foreseen, and some of the points on which most stress has been laid may prove in practice to be much less formidable than was anticipated.

Mr. Webb makes a powerful attack on what he terms the illegal limitation of medical treatment. He protests strongly that the Commissioners in limiting medical treatment as they have are exceeding their powers. He believes that such a restriction is a violation of the law and that the Courts at the first opportunity will say so. He is anxious that for the insured person the very best medical treatment should be provided and should include every emergency likely to arise. This is, of course, the ideal, and towards the fulfilment of that ideal we believe the Commissioners will be gradually forced by public opinion. It is simply a question of money. For the remuneration at present offered the medical profession cannot give unlimited medical and surgical treatment. The Government has recognized this and has said that with the money at present available it can only offer a certain amount of medical treatment. Anything outside this must be provided either by the patient himself or by resort to a medical charity. It is an unsatisfactory position and one which the British Medical Association did its best to bring home to the Government; and the profession will watch future developments with interest.

In conclusion, we freely admit the force of many of Mr. Webb's criticisms, and appreciate his sympathy with many of the difficulties of the medical profession, but it is as well that he should understand that his suggested remedy—namely, that of a whole or part time service, which, as far as we have been able to see, is incompatible with anything approaching free choice of doctor—is regarded by the profession, and we believe by the majority of the public, as an evil to be escaped. Private medical practice may have its drawbacks, but it accords best with professional traditions and preference. If the ideal of universal private practice cannot be attained, so that every patient shall be free to call in his own doctor and able to pay him the ordinary fees prevalent in the district, then we say with conviction that the profession as a whole vastly prefers the panel system to Mr. Webb's State service.

A PHILOSOPHER AND HIS DOUBLE.

A STRIKING example has recently been added to the number of those curious intellectual coincidences of which the almost simultaneous formulation by Darwin and Russell Wallace of the principle of natural selection is among the most familiar. This time it is Professor Bergson who is revealed as the possessor of a spiritual double, in the person of Mr. Henry Mills Alden, "dean of the American editorial world, for forty-three years editor of *Harper's Magazine*, and the monthly penman of the 'Editor's Study' in that publication." In an article entitled, The Bergson Method Confirmed,[1] Mr. J. W. T. Mason calls attention to the extraordinary resemblance of the views set forth by Mr. Alden, in a book entitled *A Study of Death*, to those already familiar to all readers of the distinguished French philosopher. Yet Alden's book was published twelve years before Bergson wrote *Creative Evolution;* in fact, there is not the least doubt that the two authors arrived quite independently at practically identical conclusions. The parallelism of ideas is all the more striking on account of the fact that the two thinkers concerned have reached these conclusions by contrary routes, the one by a train of thought originated by meditation upon death, the other by self-identification with life in its fullness and essence. And whereas one—the American—speaks primarily as a *littérateur* and a critic, the other has at his disposal the equipment of a professional philosopher, a student of science, and a learned psychologist. But from points of view so distinct and dissimilar both have arrived at the same world-conception of an eternal creative process, a vital flux whose substance is real time or duration; at the primary nature of the differentiation between reason and instinct, and the concurrent loss and gain involved by our sacrifice of the latter to the former mode of consciousness; at the continuity of

[1] *North American Review*, January, 1913, pp. 90–104.

the real, and the falsification resulting from its being broken up into the isolated "facts" of conceptual knowledge; and at the anticipation of an "ultimate mysticism" defined by Mr. Alden as "one with native intuition, but including a perspective commensurate with the visible universe."

Nor is the consensus of these two minds confined to fundamental conclusions; it extends even to such comparatively external matters as the choice of illustrative metaphors. Readers of *Creative Evolution* will recall a famous passage in which, contrasting the negative or descending movement of matter with the positive or ascending movement of life, Bergson compares the latter with "the fiery path torn by the last rocket of a firework display through the black cinders of the spent rockets that are falling dead." Mr. Alden concludes a sentence referring to the transition from the incandescent nebula to the cooled and contracted earth crust as of the nature of a descent, by the remark that "we cannot but regard the progression of cell life as an ascension, as if from the cinders of extinguished fires some new flame had arisen, more nearly imaging the flame of the spirit." The following quotation from *A Life after Death* might also be mistaken for a translation from any of Bergson's works: "Generally the terms of science are unvital. . . . Science is confined to a formal conception of existence, and is concerned with quantity . . . rather than quality." Mr. Mason gives a number of such excerpts, but we must refer those interested in the matter to the original article. The writer claims, not without some justice, that the occurrence of so remarkable a coincidence, under circumstances precluding the possibility even of unconscious plagiarism, constitutes a vindication of the Bergsonian method and of the truth and objectivity of its results. "The conclusion," he says, "therefore becomes inevitable that at least this one fact of the intuitional method is proven: *it works*." It suggests also that the succession of those constantly varying modes of conceiving reality of which philosophic systems are the formal expression is not arbitrary, but governed by economic and other conditions, in such manner as to exhibit a quasi-logical sequence and to summarize the spirit of the times. "In philosophy," says Hegel, "the latest birth of time is the result of all the systems that have preceded it, and must include their principles; and so, if on other grounds it deserve the title of philosophy, will be the fullest, most comprehensive, and most adequate system of all."[1]

MEDICAL PROVERBIOLOGY.

THE series of articles which have been appearing in the JOURNAL[2] recently must have discovered to many a reader an altogether unsuspected richness in the field of medical proverbiology. Every medical man is now and again meeting with proverbs in his daily experience; sometimes his patients cautiously produce them in order to get their own way or to criticize their doctor's management of their illness; sometimes he himself employs a wise saw to enforce a necessary but irksome kind of treatment or a prolonged degree of rest in bed; sometimes the midwife cheers her fainting parturient primipara with the phrase, "Sick labour, quick labour," whilst the obstetrician who dreads the forceps says sententiously, "Meddlesome midwifery is bad"; and sometimes (too often perhaps) the ungrateful patient, in presence of his doctor's little bill, falls back with relief upon the many saws which declare that to Nature, who really worked the cure, and not to the physician, the fee ought to go (Nature, conveniently enough, having no bank account into which cheques can be paid). But, even allowing that proverbs play their part in medical practice, who would have thought that there were so many wise sayings about such matters as prognosis, diet, symptomatology, alcohol, and the doctor himself as have been set forth in the series of articles referred to? The subject, indeed, has not been exhausted, and there may yet appear a second series dealing with proverbial sayings about special drugs and methods of treatment, about midwifery practice, and about children's diseases.

The study of medical proverbs raises two sets of questions: the first set contains the problems which are common to all proverbs, medical or lay; the second set deals with those which are special to medicine. Let a glance be cast at one or two in each class.

First, then, what is the part played by proverbs in daily life; what do they do for us that they should be so long-lived and, generally speaking, so much respected? To this question there are several answers possible; but, in the first place, proverbial sayings throw the note of emphasis upon important things in life. They serve to indicate the red-letter matters in experience; they are as sublineations or italics are to the printed page; they are the asterisks of popular thought. Perhaps the writer of the articles throws too heavy an emphasis when he calls every proverb "a precious stone of experience laboriously cut and polished until every facet of it flashes forth the bright light of wisdom"; but he can claim that proverbs do indeed receive very generally an amount of respect bordering upon worship from many people who are not deficient in worldly wisdom. Many a time an orator has brightened a dull part of his speech or strengthened an infirm section of his argument by the opportune employment of a pithy and appropriate piece of proverbial wisdom; the weak controversialist has sometimes snatched a victory out of the hands of a strong reasoner by a wise saw of three or four words, very much as Byron, we are told, "vanquished Berkeley with a grin." Again, proverbs have been used as guides to conduct in circumstances where decision was difficult; but it is to be remembered that they do not of themselves constitute a body of wisdom, for, whilst "Solomon made a book of proverbs, a book of proverbs cannot make a Solomon." Indeed, the adage as an arbiter of conduct is a dangerous guide, although the danger is lessened by the common experience that there are generally opposed proverbs, which, coming together, destroy one another, and leave the person who is trying to direct his steps by them to seek another and a surer pilot. These two aspects of proverbs—that they underline the *notabilia* or *memorabilia* of life, and that they have been used as guides in ethics—are evident not only in the general affairs of existence, but also in the special circumstances of medical practice. Thus the saying, "Joy, temperance, and repose slam the door on the doctor's nose," if somewhat unkindly worded, yet emphasizes the great value of prevention by other things than medicine, and Dr. Diet and Dr. Quiet are, beyond all doubt, formidable rivals to the general practitioner. There are doctors, too, whose canons of practice are not unlike those of the people who try to steer the barque of conduct by the rudder of popular proverbs; they prescribe by rule of thumb

[1] *The Logic of Hegel*. Translated by W. Wallace. Page 23.
[2] BRITISH MEDICAL JOURNAL, ii for 1911, p. 1481; i for 1913, pp. 178, 291, 398, and 505.

and work by empiricism, and so sometimes they come perilously near the confines of quackery.

There are aspects of medical proverbiology which are special thereto. Why, for instance, should there be crowds of proverbs in dispraise of the doctor, and hardly a single one in his praise? A prophet is not without honour save in his own country and in his own house; but the doctor seems (so far as proverbs go) to lack honour both at home and abroad. In the articles several possible causes of the unpopularity of medical men with the makers of proverbs are suggested, and some of them are in keeping with experience. Perhaps most weight should be given to the fact that few wish or try to remember unpleasant or distasteful times in life, such as illnesses, which come to check gaiety and suggest gloomy reflections, and that since the doctor is inevitably associated with these times he shares the general reprobation. Stevenson, it is true, said of one of his doctors that "his visits made it a pleasure to be ill"; but it is not every doctor who has his Stevenson, and indeed it is not every doctor who deserves to have him. We are touching fundamentals here when we wonder what it was in Stevenson's doctor which made his visits pleasant. It can hardly be believed that it was simply on account of the prescriptions he left or the medicines he sent for the relief of pain or distress; it may have been, it is very likely that it was, because the medical man had a mind large enough to find room for other matters than the business of his profession; indeed it may be hazarded that he had a fine taste for the beautiful in literature. Is there not here subject for thought? Is the medical man of the future to be worried out of the humanities and forced to be no more than the prescriber of pills and the writer of sickness certificates? Are his visits to be no more highly valued than the matutinal calls of the milkman? We have wandered somewhat far away from medical proverbs, but there may be a closer connexion between the paucity of adages in praise of the doctor and the commercialization of practice than is immediately apparent.

To one other special question a word may be given. Why should the proverbs on alcohol be so divided? Here again fundamentals are being dealt with; when it is known what is the factor or factors which determine the genesis of a proverb, what it is which decides the sayings that are to survive and those that are to pass stillborn away, then perhaps it may be discovered why proverbial medicine is a divided house on the subject of alcoholism.

THE BUILDING OR EXTENSION OF SANATORIUMS.

THE Local Government Board has issued a memorandum, prepared by its architect and medical officer, on the planning and construction of inexpensive buildings for the treatment of cases of tuberculosis. The Board states that it is necessary to adopt forms of construction as economical as is compatible with efficiency, and we may add that, on other grounds than that of immediate financial exigencies, it is undesirable to erect costly buildings in a manner insusceptible of modification and improvement in the future. While advising that the additional accommodation, which in many areas is immediately necessary, may, as a rule, be more expeditiously provided at, or in connexion with, existing hospitals and sanatoriums where provision for administration already exists, the Board states that complete institutions may be built in a comparatively short time if the suggestions contained in the memorandum are followed. The advice is repeated that a sanatorium for the treatment of early cases of tuberculosis should, where practicable, contain at least 100 beds, but if the population of an area does not justify provision on this scale, and it has not been found feasible to arrange for a combination of areas, the Board will be willing to consider proposals for providing institutions with fewer beds. The memorandum contains two sketch plans, one for a suggested pavilion for 50 patients, showing one ward for 12 beds, six for 2 beds each, and one for 1 bed in each wing, with a verandah in front of the seven smaller wards. The two wings are shown separated by a dining hall used by both sexes, and a site for kitchen and offices. The administration block and the laundry and boiler-house would be detached buildings at a short distance. The other plan shows a pavilion for 20 patients of one sex; it is again in two wings, each containing five bedrooms with 2 beds each. Those responsible for erecting new buildings or additions to existing buildings may be glad to be reminded of the full report by the late Dr. Bulstrode on *Sanatoria for Consumption and certain other Aspects of the Tuberculosis Question*,[1] issued in 1908 as a supplement to the report of the medical officer of the Local Government Board, 1905–6. The memorandum now issued by the Local Government Board concludes by an admonition to the councils of counties and county boroughs in England as to the importance of organizing without delay an efficient system of dispensaries, on the ground that a large proportion of cases suffering from tuberculosis at any one time can be properly treated at an efficient dispensary, and that the selection of suitable cases for treatment in residential institutions will be more satisfactorily effected where a dispensary system is in operation.

RECENT OBSERVATIONS ON ATHEROMA OF SEPTIC ORIGIN.

IT has long been recognized that arterio-sclerosis may be set up in the later stages of infectious disease, and positive results have been obtained after experimental inoculation with the typhoid bacillus, staphylococcus, and an organism obtained from a case of ulcerative endocarditis. These experiments, however, have been somewhat limited in scope, and hence a series of observations conducted on a larger scale in Professor Metchnikoff's laboratory, by Dr. Y. Manouélian, deserve special attention.[2] Full particulars are given as to the strains of staphylococcus used and as to the elaborate methods of staining the sections of the affected vessels, the results of which are shown in some excellent plates. Rabbits and a few monkeys were the animals employed. Aortic changes are not uncommon in the adult rabbit, and have been said to occur in from 4 to 19 per cent. of the cases observed. This fact has to be borne in mind when assessing the value of the results following artificial introduction of the staphylococcus, but as it is recorded that no less than 84 per cent. of the observations gave positive results, there can be no doubt as to their significance. In the case of the monkey the positive results were even more striking, as 5 out of 6 were positive. It may be noted that the most marked effects were produced by repeated injections of the weaker strains of coccus, the effects of the stronger strains were often too rapidly fatal. In appearance the atheromatous patches presented the familiar superficial aspect, and almost all were situated about the arch, and not in the course of the vessel. In a few instances the arterial disease was found to be advanced and tending to aneurysm, the walls containing calcareous or cartilaginous material. Microscopically, the changes were found to be mainly due to degeneration of the elastic tissue and of the muscle fibres, but the calcification is stated to have arisen from the elastic tissue only. The effect produced upon

[1] London: Eyre and Spottiswoode. 5s.
[2] *Annales de l'Institut Pasteur*, January, 1913.

the aortic wall was not always the same. In some cases marked thickening was seen, and in others the reverse. In the thickened cases the main change was found in the middle coat, while in the plaques of long standing no trace of elastic tissue could be discovered. Many of the experiments extended over a considerable period of time, and details are wanting as to the symptoms shown by the animals during their long course of acute and subacute septicaemia. No positive microscopic evidence is given as to the direct relation of the staphylococcus with the aortic lesion. So high a percentage of local disease produced by the artificial induction of chronic poisoning must be regarded as throwing considerable light upon the possible causation of the aortic atheroma so commonly met with, after middle age, in man.

NON-ABSORPTION OF DRUGS ON INTRAMUSCULAR INJECTION.

A RADIOGRAPHIC curiosity of very great interest was recently described by Spéder.[1] In skiagrams of the hips of a patient the image of the bone was obscured by a number of abnormal and at first unaccountable shadows, arranged in radiating lines, their direction corresponding exactly to the form of the muscular fibres. Normally, as we all know, the muscles give little or no radiographic image. The hypothesis of osteomata was eliminated by the localization and general form of the shadows, and pathological calcifications fail to give this appearance with the *x* rays. There remained the hypothesis of a modification in the transparency of the tissues, owing to the introduction of foreign bodies, and this was confirmed by the history of the patient. He was aged 39 years and had suffered at various times from acute rheumatism, ultimately affecting the hips. In 1909 chronic arthritis of the coxo-femoral articulations was diagnosed, but a radiograph made at the time, and again at the beginning of 1911, showed nothing abnormal beyond the osseous and articular lesions. More important evidence was, however, obtained. The patient, it was elicited, had contracted syphilis, and had received a large number of intramuscular injections of mercurial salts. Three series of such injections were made from 1907 to 1911. In the latter year one medical man, connecting the lesions of the coxo-femoral articulations with the syphilitic infection, submitted the patient to a series of intramuscular injections with a different solution, which was probably iodipin (that is, iodine combined with oil of sesame), and thirty such injections were made in the muscular masses at the hip. The skiagrams revealing the curious opacities just described were made twelve months after these injections, and as those made previous to the injections showed nothing abnormal, it seemed reasonable to attribute the appearances to the non-absorbed drug. It is well known that a number of preparations used in medicine, including the iodine group, are somewhat opaque to the *x* rays, and all radiographers agree as to the persistence of shadows due to injections of iodoform paste in fistulous tracts and osseous cavities. But medicaments which might be expected to be easily absorbed usually disappear rapidly. Among patients submitted to a series of injections of mercury biniodide, Spéder sought in vain for any traces of the medicaments persisting after some days. In another patient iodipin was absorbed within nineteen days after injection. The state of the muscles, apparently, is of importance, and it was thought probable that in the patient who showed the strange opacities, a year after injection, there had occurred a fibrous proliferation, due to the many previous injections of mercurial salts in the muscular masses at the hip, thus rendering the muscle less capable of absorbing such a salt as iodipin. From the radiating arrangement of the shadows, the opaque bodies appeared to be localized in the interfascicular cellular tissue. The interest of the observation from the therapeutic point of view lies in the fact that the radiograph may indicate whether or not the absorption of the drug has taken place in a normal manner.

[1] *Arch. d'électr. méd.*, September 25th, 1912.

THE MNEMIC THEORY.

PROFESSOR JAMES WARD, in his choice of *Heredity and Memory*[1] as the subject of the Henry Sidgwick Memorial Lecture for 1912, has earned the thanks of all who are interested in the important and highly controversial problems which the topic inevitably suggests. The lecture was without question a serious and weighty contribution to the growing volume of dissentient criticism of Weismann's conception of heredity. No doubt, in a sense—and many will be glad to have the full text, which has recently been published by the Cambridge University Press—Weismann's conception may still be said to occupy the central position: it is to-day the orthodox view. But the attacks upon it are growing daily stronger and more confident; many biologists are already convinced of its inadequacy; still more, we venture to think, have at least their secret misgivings upon the point. So long ago as 1895 Delage succinctly stated the Weismannian dilemma, though he had been preceded by Professor Hartog of Cork in 1891. "Without the inheritance of acquired characters there can be no new ancestral plasms, and without ancestral plasms more complicated than those of the protozoa there can be none of the superior animal." To extend the range of natural selection from the environment to the intragerminal constituents does not advance matters, for by no possible shuffling of protozoan unit-characters can such variations as will avail to produce metazoan progeny be brought about. To account for that, some new factor must be hypothecated; whether that be the inheritance of acquired characters or some other and unknown potentiality, matters little; in either case the absolute continuity of the germ plasm, which is the base principle of Weismannism, has to be given up. Professor Ward does not, of course, advocate the revival of the Lamarckian contention that all acquired characters are heritable; as we understand him, he would limit the possibility to those which have been so thoroughly mechanized by habit, perhaps in the lives of several successive generations, as to become, in Hartley's phrase, "secondarily automatic." Regarding the germ cell as a definite psychic unity and its nucleus as the functional analogue of a central nervous system, he attributes its recapitulation in palingenesis of the main events of racial history to the momentum of organic memory. "We may," he says, "compare it (the germ cell) to a company of actors awaiting behind the scenes the call to begin their play. Each one knows his part by heart and also knows his cue. The routine or orderly rhythm of the performance is thus ensured, and the play, though continually condensed at one end and extended at the other, has been so often repeated as to be acted without a hitch or hesitation, save, perhaps, in the case of its latest amendments."

[1] *Heredity and Memory.* By James Ward, Sc.D. Cambridge: At the University Press. 1913. (Cr. 8vo, pp. 56. 1s. 6d. net.)

THE "INDEX CATALOGUE."[2]

IT is hardly a year since the sixteenth volume of the second series of the *Index Catalogue* of the Surgeon-General's Library at Washington was noticed in the JOURNAL (vol. i, 1912, p. 799), and now the seventeenth is ready for use. With the appearance of each new volume the impression of the vast extent of modern medical literature is strengthened. We may take as an instance the subject of syphilis, which occupies 200 closely printed

[2] *Index Catalogue of the Library of the Surgeon-General's Office, United States Army.* Second series, vol. xvii. Suaheli-Testut. Washington, 1912.

pages in this volume; these pages contain nothing more than the titles of the various books and articles which have been written on the various aspects of this disease since the publication of the corresponding volume of the first series in the year 1893. If eighty or ninety references to articles or books be the tale for each page, and roughly speaking it may be put at eighty, we have the enormous total of 16,000 papers on syphilis in twenty years! If a student of the subject had been reading some fifteen or sixteen of these articles a week all these years he would only just have kept himself abreast with the literature pouring from the world's press on this one subject. Then when we come to analyse the subheadings under which the subject is catalogued the wonder grows; there are about 220 of them. If one of these be taken—say congenital syphilis—it is found to be treated under the following heads: Blood in congenital syphilis, cases and statistics, causes and pathology, complications and sequelae, contagiousness, death and sudden death, diagnosis, effect upon descendants, eye in congenital syphilis, haemorrhage in, manifestations of congenital syphilis, cutaneous, late, and pseudo-rheumatic manifestations, prevention and treatment, with salvarsan (606), prognosis, reinfection, serodiagnosis, teeth, treponema, urine in syphilis; and these, let it not be forgotten, are only the subheads under a subhead (congenital syphilis). To turn, however, to some of the many other matters catalogued in this volume. There is symphysiotomy, with twelve pages and eight headings; there is syringomyelia, also with twelve pages; two pages sufficed for each of these subjects in the first series of the *Index Catalogue*. There are suprarenal bodies and extract with thirty-two pages; in the first series suprarenal bodies had four pages, and suprarenal extract did not appear. Then here are some of the new headings (omitting authors' names): Sychnuria, syggignoscism (with its cross reference to hypnotism), symbiogenesis, symmetroscope, sympathectomy, symphorol, symphytum officinale, synaesthesia, synchytrium, syncytiolysis, syncytioma, syncytium, syndrome, synechotomy, synergia, synkinesis, synophthalmia, synovectomy, synoviotomy, syringobulbia, syringocystoma, and sysoma. Perhaps, nay, certainly, the most interesting pages are those in which the treasures of the Washington Library in the department of texts illustrating the history of medicine are set forth in order, beginning with pre-Hippocratic medicine, and running on through Greek and Graeco-Roman, Mohammedan, and Jewish, Mediaeval, Renaissance, seventeenth century, and so down to the modern period. It may be safely predicted that many a medical bibliophile's mouth will water as he reads over the list of texts and incunabula gathered together in this library, and many a worker in the subject of medical history will wish he lived near Washington. But why are these treasures entered under the heading "Surgeon-General's Office, Library of the."? Who will think of looking for them under that rubric? Doubtless they will be cross referenced, however, under "Texts" or "History of Medicine."

SLEEPING SICKNESS AND BIG GAME.

AT a recent meeting of the Society of Tropical Medicine and Hygiene a paper by Dr. A. G. Bagshawe detailing recent advances in knowledge of sleeping sickness was read. A very full and detailed account of the large amount of work that has been done on the subject during the last year was given, and an animated discussion afterwards took place. Dr. Yorke, who had just returned from Africa where he had been serving on one of the sleeping sickness commissions, was able to relate experiences of the greatest value. A careful study of the epidemiology of the disease has brought him to the opinion that all game that is capable of being infected with trypanosomes of man and domestic stock should be destroyed; for practical purposes this would mean the destruction of all the African fauna in inhabited regions. The game he believes stands in the way of the progress of civilization. Dr. Moffat, and other speakers competent to judge on the subject, were also, though with regret, of the same opinion. Dr. Moffat went so far as to suggest that the Chartered Company should destroy all game south of the Zambesi, an experiment which would show whether the disease would spread south into a gameless tract. His belief is that man cannot live and farm by the side of big game, as the latter brings trypanosomiasis; and he suggests that zoological interests might be conciliated by making large reserves in the districts to the north. Many other speakers pointed out the difficulty, amounting almost to impossibility, of exterminating game. There is no doubt that the subject is one of immense importance, and a decision sooner or later must be made. Sir David Bruce is now working at the question, and the results of his labours will be anxiously awaited by everyone, be he scientist, hunter, colonist, or Government official.

RACIAL RESPONSIBILITY.

A CONFERENCE organized by the Eugenics Education Society, and held at the University of London on March 1st, was largely attended by schoolmasters and schoolmistresses of the elementary and secondary schools and training colleges. Major Darwin, the president of the society, who was in the chair, explained that the conference was convened as an indirect consequence of the growing interest in eugenics. No one could deny that the world would be greatly the better if it contained fewer of the insane, the feeble-minded, the drunken, the diseased, and the unemployable, and as many individuals as possible of high character and good ability and physique. For the present energy might well be concentrated on an attempt to eliminate all the types which were unquestionably bad, whilst encouraging the appearance of those which were unquestionably good. Any marked success in such an effort would mean that our descendants would come very near to the attainment of the eugenic ideal. Mr. W. A. Nicholls (ex-President of the National Union of Teachers), in referring to the difficulty of introducing eugenics into the public elementary schools, said that the subject required such cautious handling, and must be so carefully and gradually led up to, that in view of the little spare time left to the teacher in an already crowded time table, he could see no prospect of its being incorporated in the school curriculum. In the present condition of public opinion the only persons who could do it with safety were the parents, and every parent, at all events at present, should be left to judge for himself in the matter. Mr. J. H. Badley (Head Master of Bedales School, Petersfield) said that, as with all social problems, the subject must be attacked from two sides—from without by the moulding force of the environment, and from within by such personal influence as could be brought to bear upon the individual child. The surroundings and conditions of the child's school life should be such as would foster wholesome habits and a wholesome attitude of mind; and good sense and good feeling should be appealed to, not by moral lectures or inquisition, nor by books or pamphlets, but by quiet, friendly talk. The Head Master of Eton said that some misgiving existed as to the ideals of eugenics being in some sense divergent from those of religion. But all might agree that the aim of both was correctly described as the implanting of truth in growing minds, or, better still, the training of young minds into truth. The religious aim would be primarily a bringing of the human into touch with the Divine mind; the eugenic aim would not conflict with this, but would emphasize the indispensable character of training in science, the fostering of the scientific spirit, so that the

action of heredity and environment might be discerned and the claim of posterity on the present generation clearly recognized. Probably it was correct to say that eugenics hoped to supplement the religious ideal with something of a more intellectual kind, for many who belonged to the new movement found that the older school of thought lacked the scientific spirit, especially in matters of race training, where the English disposition to ignore the connexion between cause and effect had told, and was still telling, with disastrous results to the racial development at the present day. At the close of the meeting Major Darwin proposed: "That the Minister of Education be asked to receive a deputation requesting an inquiry as to the advisability of encouraging the presentation of the idea of racial responsibility to students in training and children at school." This resolution, which was seconded by Mr. Mortimer, the delegate of the National Association of Head Teachers, was carried unanimously.

BINOCULAR VISION AND FATIGUE.

PROFESSOR DUFOUR of Nancy, in a paper read before the Biological Congress, which met in that town at the end of last year, pointed out that fatigue might under certain conditions render binocular vision very difficult. In general, when we look at a luminous point, the images perceived by the two eyes are fused without conscious effort. The visual apparatus is so constructed that binocular vision is almost mechanically produced. But if the natural desire for fusion be abolished by using a prism or a Maddox rod the two images do not invariably fall together. The streak of light formed by the glass rods does not always pass through the image of the source of light seen with the other eye. To fuse the two the natural position of repose and equilibrium should be found when the axes of the eyes are parallel. This is by no means always the case. In cases where they diverge or converge single vision is only obtained by an effort, conscious or unconscious. It is attained by the aid of the retinal reflex or the reflex of Parinaud. This reflex is always called into action by those whose optical axes are not parallel, those, in other words, who do not possess orthophoria. If the axes diverge we speak of exophoria, if they converge, of esophoria. This reflex is more difficult to excite when the subject is fatigued, and the difficulty may pass into impossibility. Such an individual will complain that when he has read for a certain time he sees double. The constant use of Parinaud's reflex may be in itself a cause of fatigue. Sensitive persons, especially those with a tendency to neurasthenia, may experience chronic headache, usually referred to the occiput, which is solely due to this heterophoria, and this can often be relieved by the use of appropriate prisms. Dufour alluded only to a tendency to diverge; but a convergence in the resting position may be equally effective in causing headache and other symptoms of eye-strain. Still more must we regard hypophoria—a tendency of one eye to turn up or down—as a cause of asthenopia. These errors of muscle balance are never overlooked by the careful ophthalmic surgeon, who always tests his patients for heterophoria with the Maddox rod and other phorometers, and in many cases achieves success with suitable prisms. When the error is great operative treatment may be called for; but it is rarely thought necessary, at any rate on this side of the Atlantic. In America Stevens and others carry out partial tenotomies, and claim many brilliant cures.

THE TREATMENT OF PLACENTA PRAEVIA.

PROFESSOR G. ZINKE of Cincinnati[1] urges that a better form of treatment for placenta praevia is required than those now in general use. He reviews present-day methods of treatment, and as to rest in bed, with a bag of ice on the abdomen, he says that it does not save many women. With regard to plugging, he admits that at times a mother, and rarely even a child, may thus be saved; but he thinks it doubtful whether this method can be regarded as satisfactory. He discusses next the Braxton-Hicks or similar methods, in which uterine contractions are stimulated either by bringing down a leg or by perforating the membranes; this method is freely used, but something approaching 10 to 20 per cent. of the mothers and 65 to 75 per cent. of the fetuses are lost. The fourth method is by dilating bags, such as those of Barnes, Champetier de Ribes, Braun, and Vorhees, or the metal dilators; but he commits Bossi's murderous instrument to collections of relics of a barbarous time. Lastly, he speaks of vaginal and abdominal Caesarean section. Now, the strange thing about Professor Zinke's attitude is that, while he claims that he was the originator of this treatment for placenta praevia, and although he discusses at some length its life-saving possibilities, he admits with frankness that he has never yet treated this condition by opening the uterus. Others have done so, and Pankow has succeeded in delivering eight mothers by this method with the loss of only one fetus. All the mothers recovered. Others have followed this example, but Professor Zinke does not attempt to give anything approaching collected statistics. On theoretical grounds, it would seem that the risks to both mother and child could be reduced to a minimum by such a procedure. But, even if it is, the country practitioner will be hard put to it if he be required to perform a major abdominal or vaginal operation in every case of placenta praevia. It seems, therefore, that there is still room for the discovery of a method of treating which shall be at once simple and efficient.

[1] *Deut. med. Woch.*, November 21st, 1912.

THE SPIROCHAETES OF RELAPSING FEVER.

FOUR different kinds of spirochaetes have been found in different types of relapsing fever. The European fever is due to Obermeier's spirochaete; the African fever to a parasite discovered by Ross, Milne, Dutton, and Todd, and named after Dutton; a second African variety to a spirochaete discovered by Koch; and the American variety to a spirochaete called *S. novyi*, after Novy and Knapp, who discovered it. The Obermeier organism does not lend itself readily to cultivation by passage through rats and mice, but monkeys can be infected with it. The other three can be grown in the bodies of rats, mice, and monkeys. H. Noguchi[1] states that all attempts to cultivate these spirochaetes outside the animal body have failed up to the present. His success in respect to the spirochaete of syphilis and *S. pertenuis* incited him to employ the same method with the parasites of relapsing fever. He collected the blood from infected rats or mice two or three days after infection. The blood was withdrawn from the heart by a sterile glass pipette, and was kept fluid by the addition of sodium citrate solution. The mixture was well shaken until a satisfactory suspension was obtained. A portion of rabbit's kidney, removed with aseptic precautions and immersed in sterile ascitic fluid, which must not be too old, forms the culture medium. About 10 drops of the blood suspension is added to the medium, and 15 c.cm. of the ascitic fluid introduced, and sterile paraffin oil is added to one of each pair of tubes. The tubes are then incubated at 37° C. The growth is controlled by examination with the dark field microscope. With *S. obermeieri* and *S. novyi* the maximum increase is usually attained about the eighth day, with *S. duttoni* and *S. kochii* about the ninth day. Shortly after having reached the maximum the parasites show a change, in that the individuals become less active, and may lose their power of motion altogether. Within the course of a few days many degeneration forms are seen. A

[1] *Münch. med. Woch.*,

temporary regeneration can be attained by the addition of fresh ascitic fluid. Noguchi has succeeded in subculturing these spirochaetes through four and more generations, inoculating the new culture medium with 0.5 to 1 c.cm. of the old culture, and using as far as possible the same ascitic fluid, provided that the growth has been satisfactory. Koch's spirochaete is the most easily cultivated, and Noguchi has succeeded in keeping one strain going for six months through twenty-nine generations.

INTERNATIONAL COURTESIES.

THE welcome usually accorded to leaders of scientific thought by nations other than their own is one of the pleasant features of modern life, and an agreeable contrast to the feelings engendered by perpetual reference to the ever-increasing preparations for international strife. Whether they be pioneers of modern advance or heroes of bygone scientific triumphs, their names invariably attract an enthusiastic audience when they elect to appear on a foreign stage. We have lately been privileged to hear from his own lips the latest developments of Professor Metchnikoff's labours, but it is not often that a leading position is accorded to a British writer in an important foreign journal. Hence it is with particular pleasure that we note the publication in a recent number of the *Berliner klinische Wochenschrift* of a long article on functional diseases of the arteries from the pen of Sir Lauder Brunton. The subject is one which has engaged his thoughts for many years, but it has not, perhaps, received the amount of general attention its importance would justify. The superficial phenomena of abnormal pulsation in a great artery, the various degrees of morbid flushing of smaller vessels, the vascular disturbance manifest in Graves's disease, and the no less evident contractions resulting in pallor and gangrene, are well known examples of functional disorder, but there remain a large number of conditions which may reasonably be attributed to functional derangement, although not so easily demonstrated. Foremost among these is migraine, a disease by no means uncommon in the medical profession, and one of which Sir Lauder Brunton is able to speak from personal experience, as did Professor Emil Du Bois-Reymond in his turn. A considerable portion of the article which appears in our Berlin contemporary is devoted to the probable causation of the pain and the ocular symptoms which so frequently accompany an acute attack. Spasmodic contraction of the temporal artery was discovered in their own persons by both of the distinguished sufferers, and the almost instant relief afforded when the spasm was overcome by mechanical or medical means was noted in each case. The tendency for the disease to subside as years advance corresponds also to the lessened liability of the arteries to functional disturbance of all kinds. Sir Lauder Brunton's paper covers the whole subject, and may be described as a summary of his long experience, as a physiologist and a physician, of a study to which he has devoted some of the best years of a long life.

AGED AND INFIRM MEMBERS OF APPROVED SOCIETIES.

WE have on several occasions recently called attention to the history of the arrangement which was entered into between the representatives of the British Medical Association and of the friendly societies at the conference held at the Treasury in October, 1911, with regard to attendance on aged and infirm members of those societies. On behalf of the Association it was agreed that the old and disabled members should not be charged any more than insured persons for their medical attendance, although, from a merely business point of view, it is evident that they might well be charged at a much higher rate. It appears, however, that the friendly societies are now trying to evade this obligation, and as this attempt was countenanced by Mr. Masterman in the speech he made in the House of Commons just before the adjournment (SUPPLEMENT to the BRITISH MEDICAL JOURNAL, February 22nd, p. 199), the British Medical Association has thought well to send a reasoned letter to the National Insurance (Joint) Committee, of which Mr. Masterman is chairman, setting out the facts. This letter will be found in the SUPPLEMENT for this week, p. 238.

HOLIDAY MAKERS AND CONVALESCENTS.

A CONFERENCE on the provision of medical attendance for insured persons temporarily absent from the area in which they usually reside was held at the office of the Insurance Commission for England on March 5th. Mr. J. Smith Whitaker presided, and with him was Mr. Schuster and other members of the Commission. In the invitation to attend the meeting it was indicated that though it was recognized that the question is one which affects doctors working under the Insurance Act, more or less, in every area, it was of special difficulty in its effect on those doctors who practised in holiday resorts and those who practised in the large centres from which the holiday makers are drawn. The medical men present were drawn for the most part from these two areas. After various aspects of the question had been put forward by medical men attending the conference, Mr. Schuster made a statement, in the course of which he said that it was not within the scope of the conference to consider the establishment of a fund to meet such cases from any other source than the general fund now allotted for medical attendance. It seemed to be generally agreed that it would be difficult to devise any method to meet the case which did not provide for the payment of medical men in holiday and health resorts for attendances in accordance with a tariff. It was pointed out that a deduction fixed in relation to the length of absence of holiday makers or convalescents from home might operate very much to the disadvantage of the doctors who were working the Insurance Act in the area in which the insured persons commonly resided and earned their living. It was also pointed out that the position of the holiday maker and the convalescent differed materially, and that not only was more consideration due to the latter, but also to his medical attendant. The Commissioners undertook to consider the views expressed, but the net result of the conference would seem to be that the matter, so far as health and holiday resorts on the one hand, and industrial centres on the other are concerned, could only be settled by a financial adjustment between the two groups.

A CENTENARIAN VETERAN.

BY a slip it was said in the article on "Mutiny Veterans," published last week, p. 474-5, that Surgeon-Major Hinton was born three months, instead of two years and three months, before the battle of Waterloo. By a coincidence our correspondent in Adelaide tells us in a private note received this week that Dr. Hinton's friends in South Australia, where he resides, were looking forward to congratulating him on attaining his hundredth year of life this week. We hope that this expectation may have been fulfilled. If so, Dr. Hinton is probably the oldest living member of the British profession, and it may be doubted whether the profession in any other nation can boast a centenarian.

THE Council of the Royal Society has recommended fifteen persons for election as Fellows. Among them are Dr. William Bulloch, Professor of Bacteriology in the University of London, and Bacteriologist to the London Hospital; Dr. T. R. Elliott, Lecturer on Practical Medicine at University College, London; and Professor Arthur Keith, Conservator of the Museum of the Royal College of Surgeons of England.

Ireland.

[FROM OUR SPECIAL CORRESPONDENTS.]

RESIGNATION OF MEDICAL STAFF OF NEWCASTLE SANATORIUM.

A VERY unfortunate condition of affairs has arisen at the Royal National Hospital for Consumption for Ireland, which was established near Newcastle, co. Wicklow, in 1896, for the treatment of poor patients suffering from pulmonary consumption in its incipient or early stage. The number of beds has been gradually increased from 24 to over 100. The number of patients treated in 1911 was over 400. The honorary medical staff consists of seven consulting physicians representing the clinical hospitals in Dublin and two visiting physicians who are also physicians to Dublin clinical hospitals; there are in addition two resident medical officers.

In April, 1911, the two visiting physicians were asked to attend a meeting of the board to express their opinion on a proposal to invite an outside medical man to try a special treatment of tuberculosis at the hospital and to place two wards at his disposal for this purpose. The two visiting physicians and one of the consulting physicians, the only medical member of the board present, expressed disapproval of the project, and it was dropped. Six weeks later the board invited the consulting and visiting staff and the resident medical staff to consider whether it was desirable to adopt any special treatment at the hospital, including that referred to at the previous meeting. The whole staff expressed the unanimous opinion that medical treatment was a matter solely for the medical staff, and that in any case it was undesirable, in the interests of the hospital, that methods unproved by scientific research should be adopted.

No further action was taken by the board at the time, but last December the visiting physicians received a letter informing them that the medical man above referred to had been appointed as an additional physician. The visiting physicians brought the letter before a meeting of the honorary medical staff, and the consulting and visiting staff thereupon addressed a letter to the board recapitulating the above facts and resigning their position on the staff. They felt that a slight had been put upon them by the appointment of the additional visiting physician without consultation with the medical staff, and considered that the action of the board made it plain that it was resolved, whenever it pleased, to dictate the medical treatment in the hospital. The staff consented, for the sake of the hospital, to withhold their resignations till the board had had a further opportunity of discussing the matter, and on the invitation of the board a friendly conference was held between four members of the board and four members of the medical staff. As a result, it appeared to be the unanimous opinion that the differences between the board and the staff could, and should, be removed on the following conditions: (*a*) A return to the *status quo ante* December, 1912; (*b*) that the medical staff should for the future be represented on the board by at least two members to be chosen annually by the staff. It was also suggested by the representatives of the board at the conference that in the event of the board assenting to these conditions the medical staff would be prepared to accept the medical man who had been appointed an additional visiting physician as pathologist to the hospital. The medical staff subsequently wrote to the board approving the conditions (*a*) and (*b*), and accepting the suggestion with regard to the change in the nature of the appointment of the additional physician.

On February 21st, however, the medical staff received a letter informing them that the board would not retreat from the position it had taken up in its letter of December, 1912, and that it would not carry out the conditions which had seemed to have the approval of the conference. Accordingly the whole honorary medical staff have finally resigned their connexion with the hospital. The following are the names of the honorary medical staff:

Consulting Physicians.—Wallace Beatty, M.D., F.R.C.P.I., Physician to the Adelaide Hospital; Michael F. Cox, P.C., M.D., F.R.C.P.I., Physician to St. Vincent's Hospital; J. Magee Finny, M.D.Dubl., ex-President Royal College of Physicians, Ireland, Consulting Physician to Sir Patrick Dun's Hospital; John W. Moore, M.D., ex-President Royal College of Physicians, Ireland, Physician to H.M. the King in Ireland, Senior Physician to the Meath Hospital; Joseph O'Carroll, M.D., F.R.C.P.I., Physician to the Richmond Hospital; William J. Thompson, M.D., F.R.C.P.I., Registrar-General for Ireland.

Consulting Surgeon.—William Ireland De Courcy Wheeler, M.D., F.R.C.S.I., Surgeon to Mercer's Hospital.

Visiting Physicians.—Alfred R. Parsons, M.D., F.R.C.P.I., Physician to the Royal City of Dublin Hospital; James B. Coleman, M.D., F.R.C.P.I., Physician to the Richmond Hospital.

CERTIFICATION OF DEATH AND PREMATURE BURIAL.

A meeting was held recently in a committee room of the Royal College of Physicians, Dublin, in order to consider the present system of death certification. The chair was taken by Sir David Harrel, and several Fellows of the Royal College of Physicians and Surgeons were present. Mr. B. R. T. Balfour, D.L., drew attention to a bill which had been introduced in the House of Commons under the name of the Deaths and Burials Bill, and read the memorandum explaining the objects of the bill, which were to provide greater precautions against (1) secret crime, and (2) premature burial. He quoted from the last report of the Registrar-General of Ireland, showing that 22 per cent. of the deaths during the previous three months had not been certified. It was resolved that Mr. Balfour be requested to send a copy of the bill to the Royal College of Physicians and the Royal College of Surgeons, asking the opinion of the Royal Colleges on it.

THE BRAIN OF PRIMITIVE MAN.

On February 28th Professor G. Elliot Smith, in a lecture to the Royal Dublin Society on "The Brain of Primitive Man," said that in discussing the subject of the primitive characteristics of the earliest forms of the human brain thoughts would naturally turn to the great loss which investigators of that class had suffered during the last few years by the death of the man who laid the foundations upon which future investigators would build their knowledge of this subject. He referred, of course, to Professor Cunningham, who was for so many years the Professor of Anatomy in Trinity College, Dublin. The great difficulty in this study was to obtain material. He exhibited a number of slides showing details of the brain development of various types of the human race. After illustrating the difference between the primitive human brain and the highest simian type, he traced the development of the monkey brain from the most elementary mammalian forms. The brain developed under the stress of circumstances, which had made it necessary to use arms, and that led incidentally to the perfect erect attitude and to the adoption of speech. These things did not come first, but followed the expansion of the brain.

ST. PATRICK'S NURSES' HOME.

At the annual public meeting in connexion with St. Patrick's Nurses' Home, Dublin, the Dean of St. Patrick's presided, and the Countess of Aberdeen was present. According to the report, the number of visits paid during the year had increased and amounted to 58,545, and 2,986 new cases had been undertaken, which, with the cases remaining on the books at the end of the previous year, made a total of 3,388. Up to the present, the National Insurance Act had been a source of loss of income to the home, but it was hoped that an arrangement could be made with the societies by which they might employ the nurses so that the home might gain some pecuniary benefit from the nursing of insured persons. Dr. Ninian Falkiner spoke from experience of the benefit to the poor of the district nursing system. It was established in 1877, and in 1889 the dispensary doctors began to send cases to the nurses. The statistics of the Dublin death-rate showed that the district nurses had something to do with the greater reduction of the rate during the period from 1889 to 1912 than during the preceding period. Another speaker pointed out that there were three points in favour of the institution—first, the nurses taught sanitation to the poor whom they visited; secondly, the system prevented the homes of the poor from being broken up; and, thirdly, the sick poor had in their homes some of the care and attention that they received in hospitals.

TYPHUS FEVER IN DUBLIN.

Early last week a notice appeared in the daily press that there was an outbreak of typhus fever in the north side of Dublin. But since then Dr. Russell, assistant medical superintendent officer of health, stated that there was no need for alarm or fear of an epidemic. There had been no case, he said, since January 25th, when there were 5 cases in a poor slum quarter at Summerhill. There had been no death, and the precautions then taken were so effective that no case had occurred there since. Three typhus patients in the North Dublin Union had been removed to the Hardwicke Hospital.

OVERCROWDING AND ENTERIC FEVER IN AN ASYLUM.

The resident medical superintendent of the Ballinasloe Asylum informed the Committee of Management at its last meeting that the institution was overcrowded to the extent of 247 patients. There were, he said, three ways by which a remedy might be found—to take over a workhouse as an auxiliary asylum; to board out a certain number of the lunaties in a workhouse and pay a certain sum for them; to erect new buildings. The committee decided to make inquiries as to any local workhouse that might be available. At the same meeting the medical superintendent reported that there had been 15 cases of enteric fever in the institution, and that 1 death had occurred during the month. In such circumstances it would seem that the overcrowding calls for immediate remedy.

MEDICAL CERTIFICATES.

At a special meeting of the doctors of North Tipperary, held in Roscrea to consider the question of medical certificates in connexion with the working of the Insurance Act, the following resolutions were passed unanimously:

1. That we, the North Tipperary Medical Committee, comprising every medical man practising in the county, seeing that the health societies are seeking to obtain certificates of illness from clergymen, magistrates, and others, in order to save the expense of medical certificates, for which provision in money has been made by Parliament, hereby direct our Honorary Secretary to send notice to all health societies having existence in North Tipperary that we will withdraw our offer of granting medical certificates at the small charge of 2s. 6d. per certificate (payable by the societies, not by the insured persons), unless medical certificates are required in all cases of illness attended by medical men, and will in future charge a full fee of £1 1s. if only called on to certify where the present methods of the societies break down.
2. That we tender our thanks to the clergy and magistrates generally of the county who, with so few exceptions, have refused to interfere with our patients or to sign certificates for them in medical matters.

At a meeting of the medical practitioners of co. Wexford, held recently at Enniscorthy, the following resolution was passed:

That we give notice to the various societies that the medical men of co. Wexford will not give any certificates under the National Insurance Act pending the arrangement of a reasonable fee with the Insurance Commission.

ROYAL HOSPITAL FOR INCURABLES, DUBLIN.

The Royal Hospital for Incurables in Dublin has been in existence since 1743. It is non-sectarian and non-political, and is supported by voluntary contributions. The patients, who come from all parts of Ireland, pay nothing. There were 209 patients in the hospital at the commencement of the year. During the year 158 candidates applied for admission, all duly certified as incurable and in poor and necessitous circumstances. Of these only 47 were successful in obtaining admission, and the Managing Committee has decided to erect two new wings, increasing the number of beds from 213 to 248. It is to be hoped that the charitable public will respond in such a manner as to allow this much-needed extension to be carried into effect without delay.

WORK DONE BY NURSES IN IRELAND.

Some idea of the amount of work done by nurses for the poor in Ireland may be gained from recent reports. A report read at the annual meeting of the Sligo District Nursing Association showed that 720 cases had been attended by the nurse during the year, and 5,696 visits paid. The total number of hours she was on duty during the year was 1,937. At the last monthly meeting of the St. Patrick's Nurses' Home it was reported that 531 cases were nursed, 233 new cases undertaken, and 4,531 visits paid during the month.

PRESENTION TO DR. GEORGE SIGERSON.

Last week, in the rooms of the National Literary Society, Dublin, Dr. George Sigerson was presented with a portrait of himself painted by Mr. Joseph Lavery. Dr. Sigerson has been President of the National Literary Society since its foundation twenty years ago. The Right Hon. M. F. Cox, M.D., performed the ceremony of unveiling the portrait, and made a suitable reference to Dr. Sigerson's work and career in Dublin.

Scotland.

[FROM OUR SPECIAL CORRESPONDENTS.]

MEDICAL INSPECTION IN SCHOOLS IN SCOTLAND.

ON March 1st appeared the first report on the medical inspection of school children in Scotland; it contains about a hundred pages, and has been drawn up by Dr. Leslie Mackenzie, medical member of the Local Government Board. The report is founded largely on the information furnished by the school medical officers for the year 1911. There are a number of matters which make Dr. Mackenzie's report most interesting. For instance, it is now proved beyond a doubt that the gloomy forecast based on the investigations made by the Royal Commission on Physical Training (Scotland) was no exaggerated alarmist statement, but sober inference from facts. Medical inspection has not only revealed actual disease, but has also shown that in thousands of cases diseased conditions have been permitted to develop which, if taken in hand at earlier stages, could have been prevented. Thus, through inspection, the opportunities of prevention have clearly been pointed out; and in many cases the revelation of the facts has been followed by treatment, although much still remains to be done. The service of nurses which has been set up in some places should be extended, the following up of cases should be more complete, and the necessity for school clinics has become still more evident. Meanwhile, the teaching of hygiene goes on, and has already done much good. It can hardly be doubted that in a few years school boards will be doing much more than educating the children in the ordinary sense of the word; they will also be playing a powerful part in securing the health and strength of the future generation of citizens.

INDIAN STUDENTS AT EDINBURGH UNIVERSITY.

On February 25th the rooms of the Edinburgh Indian Association at 11, George Square, were formally opened by Principal Sir William Turner. The association was founded as far back as 1883, and in 1902 efforts began to be made to establish a club for Indian students. Some money was obtained, and the amount was increased by the Indian fair held in 1907 and in other ways until a total of over £5,000 was reached. About three years ago the present house, adjacent to the medical buildings, was got at a reduced rent from Dr. Barbour. There are three stories and a basement, with reading, writing, smoking, and billiard rooms, and a bedroom for any new-comer who has not found lodgings. Sir William Turner referred to the fact that there are more than two hundred Indian students attending the university, and to the need which existed, therefore, for some such building as that which he was declaring open. The Indian students formed a family in the university; they were also citizens of a metropolis. The Principal was then honoured by being garlanded in Indian fashion by the president of the association, Mr. B. P. B. Naidu.

ROYAL PHYSICAL SOCIETY.

At a meeting of the Royal Physical Society on February 24th Dr. W. E. Agar brought forward facts bearing upon the transmission of environmental effects. If one of the *Cladocera*, a group of crustacea including the water-fleas, was placed under certain abnormal conditions changes took place in its structural features, and if it were removed again to normal conditions its offspring exhibited the same

peculiarities as it had acquired, and even the offspring's offspring showed them, although in a much slighter degree. The next generation, however, showed a marked reaction in the opposite direction. It was suggested that the apparent "inheritance" of the acquired character was due really to the passive transference of a toxin-like body and the later production of an antitoxin. Principal J. Yule Mackay, of Dundee, at the same meeting exhibited some ancient Peruvian skulls showing curious deformities which he judged to be due to the use of the portable cradle by the aboriginal tribes.

ROYAL VICTORIA HOSPITAL FOR CONSUMPTION.

The report presented to the annual meeting of the Royal Victoria Hospital for Consumption, Edinburgh, when the President (Sir Alexander Christison) was in the chair, pointed out that

It would be a great mistake to suppose that, because of the provisions of the Insurance Act, everything has been accomplished in relation to the prevention and treatment of the disease, and that the need for voluntary effort has ceased. Contrariwise, the claims of the consumptive poor are only beginning to be realized and understood. The treatment of insured persons affected by tuberculosis—even if we include the treatment of their dependants—covers a small portion of the field only. This is little more than the fringe of the subject. The problem of prevention before the nation is immensely wider. The effective solution will only be achieved by a close and harmonious co-operation between all the agencies, official and voluntary, which can be pressed into a concerted, intelligent service.

Up to date, 2,085 resident patients had been under treatment in the hospital. To this number must be added 329 patients who had attended the hospital daily as "visitants." The farm colony was proving successful from an economical point of view, and since the date of opening to the end of the period dealt with in the report, 50 patients had been transferred from the hospital to the colony. Up to March 31st, 1912, 23,118 individual cases had received treatment at the dispensary. Sir Robert W. Philip stated, in reply to a question, that the hospital was in communication with the Public Health Committee of the city and with the Insurance Committee, and a conference would probably take place at an early date.

WOMEN'S FIRST AID CORPS INSPECTION.

The annual inspection of the Scottish Women's First Aid Corps took place on February 26th, in the hall of the 6th Royal Scots, Edinburgh. Several members of the medical profession were present, including Colonel Arnott, Dr. Boyd Jamieson, Dr. Morrison McIntosh, Dr. Cattanach, and others. About eighty members of the corps were on parade; stretcher drill, semaphore signalling with flags, and the first aid to wounded soldiers (impersonated by boy scouts and other schoolboys) were tested. The inspecting officer, Sir Joseph Fayrer, Bart., M.D., K.C.S.I. (honorary surgeon of the corps), expressed his satisfaction with the inspection and congratulated the corps and its commandant (Mrs. Maxtone Graham). He said that in first-aid work simplicity and common sense must go together. A little knowledge was a dangerous thing, it had been stated; but in first-aid work a little knowledge simply applied with common sense might be, and often had been, the means of saving valuable lives.

England and Wales.

[FROM OUR SPECIAL CORRESPONDENTS.]

LONDON.

TUBERCULOSIS TREATMENT IN MIDDLESEX.

THE Local Government Board has signified its approval of a scheme prepared by the Middlesex County Council for the treatment of tuberculosis. The Public Health Committee reported to the Council on February 27th that, the sum available for general tuberculosis treatment having been reduced in consequence of the decision of the Government to earmark 6d. per insured person in respect of remuneration to general practitioners for domiciliary treatment, only 350 instead of 450 beds could be provided in hospitals and sanatoriums. The Council should let it be clearly understood that no further beds would be provided until an increased grant from the Exchequer was assured.

The Council approved this report, and authorized the Public Health Committee to appoint five tuberculosis officers at a salary of £500 a year each, and two assistant tuberculosis officers at £300 a year each, and to make arrangements for obtaining premises in various parts of the county suitable for dispensaries.

LONDON COUNTY COUNCIL.

Further Provision for Tuberculosis Treatment.

The London Insurance Committee having asked that accommodation may be found for 200 tuberculous cases, in addition to the 300 already provided for at the Downs Sanatorium, the Public Health Committtee reported to the London County Council on March 4th that arrangements had been made with the Metropolitan Asylums Board for the reception of 100 women patients and 100 observation and educational cases at the Northern Hospital, Winchmore Hill. The first patients were received there on March 3rd.

Lunacy Statistics.

The Asylums Committee reported that a summary of the returns furnished by the clerks to the London boards of guardians showed that on January 1st, 1913, the total number of lunatics under certificate in London county asylums, or in other public asylums under contract with the boards of guardians, and of lunatics in workhouses or with relatives or friends was 28,638. This figure, compared with a total of 28,011 on January 1st, 1912, gave an increase of 627, the largest recorded since 1909. The last previous increase which exceeded this figure was 767 on January 1st, 1905. The average annual increase for the last twenty-three years had been 533. Of the total of 28,638, the number of lunatics for whom the county of London was responsible to find accommodation was 20,931. This gave an increase of 502 over the corresponding figure for the previous year, and was the largest increase since 1905.

Effects of Changes in Poor Law Administration.

The census of homeless persons taken every year in London, on a night in February, this year showed a total of 649, which was fewer by 554 than that for 1912, and the lowest recorded. This was accompanied by a fall of 973 in the number of inmates of common lodging houses. The Public Health Committee, reporting to the London County Council on the matter on March 4th, expressed the opinion that this remarkable result pointed to the fact that, in addition to changes in the administration of the Poor Law, there were other unrecognized forces exercising a determining influence on those sections of the community. The committee noted that although the Metropolitan Casual Paupers Order, 1911, had brought about a considerable reduction in the number of persons resorting to casual wards in London, there had not been any increase in the number of vagrants in casual wards in areas adjoining the county of London.

BIRMINGHAM.

THE BIRMINGHAM HEALTH INSURANCE PHARMACOPOEIA.

A SERIOUS item in the large amount of clerical work which must be done by medical practitioners under the Insurance Act is the writing of a prescription on every occasion when medicine is ordered, even if only a repetition of what has been taken before, so that the insured person may be free to obtain the medicine from any pharmacist on the panel. Obviously, this work can be much lightened by greatly increasing the number of preparations of various sorts that can be ordered by a single name instead of by writing the full formula, and for this a comprehensive formulary analogous to the pharmacopoeias of the various hospitals is required. Since the amount of public money available for drugs under the Act is very limited, another useful object to be served by such formularies is the substitution of less expensive for more expensive preparations wherever the therapeutical effect is not sacrificed by so doing, and the reduction to a minimum of expensive ingredients, like alcohol, when only used as solvents.

The formulary of the *British Pharmaceutical Codex* contains a large number of prescriptions for mixtures, etc., but it was compiled before the passing of the Act, and evidently without any special regard to cost of ingredients. At present, therefore, we see the production of various local formularies which may perhaps some day be merged in a national one. We have recently received from Dr. E. Osborne, Honorary Secretary of the Birmingham Medical Committee, a copy of the *Birmingham Health Insurance Pharmacopoeia*, 1913 (price 2s. 6d.), which has been compiled by the Medical Committee with the co-operation of the Midland Pharmaceutical Committee. It contains about a hundred and twenty formulae for mixtures, pills, lotions, etc., representing all the most frequently required combinations; some of these are *Codex* formulae, and are not given in full but indicated by the letters *B.P.C.*; other formulae are given fully. With a view to further reducing the clerical work in prescribing every formula is numbered, so that it may be ordered by number instead of by name if desired. The reduction of cost does not appear to have been closely studied in some cases, spirit of chloroform being frequently ordered where the equivalent of chloroform water might be used, and tinctures being rather much in evidence. A note at the beginning invites suggestions for alterations and additions for the next edition; it is, of course, inevitable that a first issue of such a formulary should be in some degree tentative, but there is no doubt that the Birmingham Medical Committee has produced a very useful little book.

INFANTS' HEALTH SOCIETY.

The fifth annual report of the Birmingham Infants' Health Society and School of Mothercraft states that 429 women with infants attended the consultations. During 1912 there were 2,373 attendances, as against 2,249 in 1911, 1,296 in 1910, 1,021 in 1909, and 850 in 1908. The average attendance at each consultation in 1912 was over 50. Of the 554 infants registered 22 were lost sight of and 13 died before reaching the age of 12 months. Of the 342 newly-registered in 1912, 240 (or 70.1 per cent.) were being wholly fed on the breast at the time of registration. In 1908 the percentage was 63.3, in 1909 it was 68.8, in 1910 it was 66.8, and in 1911 it was 63.1. In 1912 the average weight of the breast-fed infants at 12 months old was 19 lb., and of the bottle-fed infants only 17 lb. 14 oz. The average weight of all infants, irrespective of feeding, was 18 lb. 11¼ oz. This weight is a marked advance on that of preceding years, and it is probable that the boom in work and wages in the past twelve months has been reacting on the infants. Probably the somewhat higher percentage of breast-feeding during the past year, and the efforts of the society to produce a greater care in feeding and a higher standard of motherhood, have had some substantial share in bringing about the result.

BRISTOL.

THE ROYAL INFIRMARY.

THE annual meeting of the subscribers to the Royal Infirmary was held on February 25th, under the presidency of Sir George White, who said that the past year had been very memorable for the institution because of the great increase in the scope of work and the addition of the new wing and alteration to the nurses' home, and, further, by a royal visit. In respect to financial matters the year had been most gratifying, for the list of subscribers had increased to 3,587, and subscriptions by nearly £300. The only item that showed a decrease was the contributions from the employees, which had diminished by about £100, at which he expressed surprise. To provide for the new buildings and the increased accommodation for nurses very large sums had been drawn from investments, and he hoped that the public would respond to the appeal for funds. The total ordinary expenditure exceeded the ordinary income by a sum of from £4,000 to £5,000. The committee in conference with the honorary staff decided not to follow the example of those hospitals which had framed new rules with regard to insured persons, and the doors of the institution would be open as before to all. During the past year the number of in-patients was 5,049, and out-patients 53,923. The usual votes of thanks were passed. Mr. J. Paul Bush, C.M.G., having retired from the active staff after thirty-seven years' service, was elected an honorary consulting surgeon.

On February 24th Mr. Bush was entertained by his old dressers and residents at St. Stephen's Restaurant at dinner, and presented with a handsome piece of plate.

Special Correspondence.

PARIS.

Causes of Arterio-sclerosis.—Arsenic and Treatment of Chorea.—Radium as a Therapeutic Agent.

AT a recent meeting of the Hospitals Medical Society Dr. Pissavy discussed the etiology of arterio-sclerosis in the light of the history of 400 cases. Only 5 per cent. of the total cases occurred between the ages of 20 and 40. The disorder was more frequent in men than in women—in the ratio of 6 men to 1 woman. Among the etiological factors he cited syphilis, alcoholism, plumbism, malaria, and tobacco poisoning; together they accounted for 89 per cent. of all cases of arterio-sclerosis. Syphilis accounts for only 13 per cent., and Dr. Pissavy believed that the importance of syphilis as the prime causal factor of arterio-sclerosis had been greatly over-estimated.

At the same meeting Dr. Triboulet discussed the use of arsenic in the treatment of chorea in children. He believed that it was an empirical remedy, and reported 350 cases of chorea, 335 of which had been treated successfully by hygiene and rest without the administration of any drug. Arsenic, even in small doses, might give rise to toxic symptoms, and thus tend rather to delay than to hasten the cure. In Triboulet's opinion chorea was best treated without arsenic, as patients usually recovered without the aid of drugs.

Professor Dominici, in a recent communication to the Academy of Medicine on the therapeutic value of radium in various tumours, thought that it was most useful as a curative agent in deep-seated angiomata and in superficial cancer. He had noted complete clinical cure of some deep-seated cancers of the parotid, neck, and uterus maintained after three to four years.

Correspondence.

DIVISIONS AND INSURANCE AREAS.

SIR,—In last week's SUPPLEMENT (p. 219) you published a letter of mine in which I referred to the necessity for a rearrangement of our Divisions and Branches, and I suggested that the only practicable plan was to make them coterminous with the areas of the Insurance Committees. Our existing Branches grew up around the towns where corporate medical life was most active; as medico-political work became more necessary, it was found that the constitution of the Association was not adapted to the work, and among other reforms the Branches were broken up into Divisions; these were planned largely with a view to convenience of meeting, but of late years our political work has brought us more and more into contact or conflict with those local authorities that in one way or another deal with affairs of public health, and these authorities represent the counties or county boroughs. It has been evident for some time that our Divisions are not convenient for this work, and to meet the difficulty joint committees of Divisions have often had to be formed.

The advent of the Insurance Act made it imperative to form Provisional Medical Committees for the areas of the Insurance Committees, and local medical unions were in many instances formed for these districts, but the machinery of the Association was not easily adapted to this arrangement, and in many instances the recognized Divisions and Branches have, as far as the Insurance Act is concerned, done practically nothing. In considering any scheme we must remember that convenience of meeting is very different from what it was even thirteen years ago—in the country districts motor cars have made medical

men to a large extent independent of train services, and the latter, too, are much improved of late years.

As to the work of the Divisions, it is important that the members of any one Division should have a common interest in it, and the conditions of practice and the requirements of medical men in the large towns are so different from those of men living in the country areas that, apart from other considerations, it seems at once evident that the natural divisions for political work should be counties and county boroughs; a short experience has shown that these are the most useful, and that the corresponding medical unions are the most effective organizations. It is, for obvious reasons, most essential that all these local organizations should be worked together under the British Medical Association, and I would suggest that our Divisions and Branches be rearranged, without any consideration of existing Divisions, so as to correspond to the insurance districts. Some of these districts will naturally form complete Branches, but in the great majority of cases insurance areas may conveniently be the areas for Divisions, and the county borough Divisions could combine with their respective county Divisions to form Branches, so that they would not be divorced from one another. This is important, on account of the scientific work, for the best conduct of which it is almost essential that country and town should co-operate—in fact, in some districts, in order that scientific work might be advanced or, at any rate, not interfered with, it might be necessary for special arrangements to be made, but there need be no difficulty about this.

The exact grouping of Divisions can only be considered by the appropriate committee and in committee, but whatever is done I hope it will be begun soon and in earnest. With a better organization, a more convenient arrangement of our working units, I believe that our strength and usefulness would be greatly increased, and if the various local medical unions which would practically constitute our Divisions so desired they could form themselves into trade unions, and so, if it should be generally desired, bring about by an easy process the change that many consider to be so essential to our constitution.
—I am, etc.,

Bradford-on-Avon, March 2nd. CHARLES FLEMMING.

THE ETIOLOGY OF PUERPERAL FEVER.

SIR,—I was much gratified to read your impartial criticism of my book, *Statistics of Puerperal Fever and Allied Diseases*, which appeared on December 14th, 1912. Your reviewer evidently studied carefully my figures, and treated them on their merits, and his criticisms prove him to be master of his subject, and show his appreciation of the difficulties involved in any attempt to obtain reliable data upon which to base conclusions liable to be affected by many conflicting conditions. His criticism was chiefly directed against my deductions from the effect of the coal strike last March upon the statistics of puerperal notifications for that month, and I welcome his criticism, since it gives me an opportunity of stating the exact figures upon which my summary was based, figures withheld lest I might overburden the text with details, although a detailed analysis accentuates their significance, a significance I am anxious that your readers should have an opportunity of appreciating.

In brief, I contend (*a*) that puerperal fever is caused generally by septic material conveyed through the medium of those conducting the labour. (*b*) That this septic material is as often conveyed by medical practitioners as by midwives. (*c*) That the source of the septic material is septic wounds, which general practitioners in industrial districts are called upon to dress almost every day. The most common cause of septic wounds is accidental wounds, and it follows therefore that where accidents abound there also will be found septic wounds in abundance, and therefore puerperal fever.

I venture to think most impartial critics will admit that my statistics go far to prove my thesis, and I must refer them to the book for confirmation of this assertion.

Meantime let us confine ourselves to the point raised by your reviewer—namely, the significance of the figures in reference to the coal strike. He writes:

> Thus he finds that, whereas the average number of cases of puerperal fever notified in the month of March for over a period of ten years was 4, only 2 such cases were notified in that month of the present year. This is a result Dr. Geddes is disposed to attribute to the diminution of accidents consequent upon the coal strike. The attribution may be correct, but if in a series of ten months 40 cases of disease occur, and if the distribution in months of the series be a random one, the chance is about 1 in 5 that we shall find 2 or less cases in a month.

Let me say at once that if this was the only significant factor brought out by the figures for the month of March your reviewer's criticism would be fatal to my thesis. But it constitutes only an insignificant straw which indicates the direction in which the wind blows. The significance of the whole wind current will be appreciated from the following table, which calls for explanation. After reading your review and referring to the original documents upon which my summary was based, I thought they were capable of being misconstrued, and appealed to Dr. Sergeant for enlightenment, and discovered that the figures for March only included cases notified, while those for April included cases notified and also cases that had died although not notified. This discovery explains the figures shown in brackets, and they represent the corrected figures after including fatal cases not notified, the existence of which was only ascertained by reference to the records of the registrars of deaths. My insistence on this ugly feature of puerperal notification shocked one of my reviewers. A perusal of the table fully justifies my censure.

I refer the reader to columns 11 and 12. Notice that the figures for 1912 in mining districts are the only figures below the average for the ten years. In all the other districts the figures in column 12 are equal to or above the average. This peculiarity is even more apparent in column 14, where the total for the two months of 1912 are compared with the figures for the same two months for the previous ten years. The total figures for all the districts reach the average for the ten years, and the figures for mining districts are the only figures below the average. I need not labour the point.

Now, what theory other than the one advanced by me will explain this coincidence? If my critics will not admit my deductions, I may reasonably challenge them to suggest an alternative explanation that will explain the facts. Your reviewer suggests that "the age constitution of the married population may vary considerably, and it is not impossible that the age of a parturient is

Cases of Puerperal Fever Notified or Reported.

Columns	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Years	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1902-1911	1912	Total cases of puerperal fever for March and April.	
													1902-1911	1912
Mining districts	4	10 (11)	6	3	2	3	2 (3)	4	3	3	40 (42)	2 (3)	84	6
Manufacturing districts ...	4 (5)	4	7	5 (6)	9 (10)	4	5	11	6	6	61 (64)	6	108	10
Mixed districts	4	1	1 (2)	1	3	2	3	3	2	5	25 (26)	3	47	4
Residential districts ...	1	1 (2)	1	1	0	0	1 (2)	0	0	0	5 (7)	2	16	3
Rural districts	0	1 (2)	0	1	0	1 (2)	1	1	0	1	6 (8)	1	21	4
Totals	13 (14)	17 (20)	15 (16)	11 (12)	14 (15)	10 (11)	12 (14)	19	11	15	137 (147)	14 (15)	276	27

a factor of some importance in relation to the etiology of puerperal fever." I have been unable to find any authority who suggests age as a factor in the causation of puerperal sepsis. If your reviewer will indicate at what age a parturient is liable to become infected I will gladly investigate the point. I intend to pursue my research, and will welcome the co-operation of any one interested in the subject. Being a general practitioner myself, I am in a position to appreciate the difficulties under which we labour, and I am convinced we must be held responsible for the deplorable and avoidable mortality from this disease.

I chose Lancashire as my field, being familiar with the county, and I have embodied in the appendix the results of my labours in the classification of registration districts and corresponding sanitary areas, which will enable the merest tyro to test the accuracy of my figures for each district.

My book was written as an appeal to my fellow-practitioners, who I confidently hope will respond, each in the county or district with which he is familiar, and I feel sure he will be amply rewarded.

No single individual could do justice to the statistics of every district in every county of Great Britain in the same manner as I arranged Lancashire, but from the knowledge gained by a cursory examination of the districts outside Lancashire, including several Scottish and Welsh counties and boroughs, I feel certain they could all show similar results to those obtained by a classification of the districts arranged in the same classes as those in Lancashire. Derbyshire, for example, should prove a fertile field for research, and I shall be delighted to proffer any assistance in my power to any one inclined to undertake the task.

I would refer the reader to your advertisement columns, page 6, for information as to the scope of the book and the press notices.—I am, etc.,

Heywood, Lancs., Feb. 24th. GEORGE GEDDES, M.D.

THE TEMPERATURE IN CHILDREN OF SCHOOL AGE.

SIR,—In the report, for 1911, of the Chief Medical Officer to the Board of Education, on p. 58, a reference occurs to an investigation of mine into the temperatures of school children. Sir George Newman expresses the hope that other investigations will be made on the same lines. He quotes my statement that "the maximum percentage is that of children exhibiting a temperature of 100°, . . . and 55.5 per cent. have temperatures not under 99.6°."

In your issue for February 8th Mr. E. C. Hort[1] states that "whenever continued fever occurs we may be almost certain that an infective process is at work." The fever I described is a condition which I am now showing persists over years.[2] Hence it would appear that Sir George Newman is outlining medical investigations of considerable importance.

But in order that the results of such investigations may be comparable, and accurate, care must be taken in the technique, and the methods used must be identical. One investigation has already been made on dissimilar lines, with dissimilar results.

The popular idea that the "half-minute" thermometer will record, in two or three minutes, the body temperature, when placed in the mouth, is a delusion. If the mouth has not been kept shut, the temperature of the interior of the mouth is not the temperature of the body, but less. If the room is cold, and the child's cheeks thin, there is so much heat lost through the cheeks that even keeping the thermometer *in situ* for fifteen minutes may not give a correct result.

I much hope that other school inspectors will follow Sir George Newman's suggestion, and I therefore venture to give the lines on which we have worked:

1. The temperature of the room in which the temperatures are taken must be not less than 56° F., preferably about 60° F.

2. The thermometer should be placed in the mouth, with the bulb under the tongue, as far back in the mouth as possible. The end of the thermometer which is not in the mouth should point upwards.

3. The thermometer should remain in position at least ten minutes.

4. The children should be watched to see that they keep the lips closed.

5. The observations should be made between the hours of 10 a.m. and 4 p.m., and should not be within half an hour after a meal, nor immediately after exercise.

6. The thermometer must be Kew-certified.—I am, etc.,

Colwall, Malvern, Feb. 13th. MARY HAMILTON WILLIAMS.

[1] Vaccines and Fever.

[2] Details and mathematical proofs will shortly appear in an Eugenics Laboratory memoir.

ACUTE PNEUMONIA DURING TREATMENT WITH ARSENIC.

SIR,—Dr. Parkes Weber's paper is very valuable in that it draws attention to the effect of arsenic on the respiratory tract.

For some years I have made it a rule to stop arsenical treatment as soon as there is evidence of respiratory catarrh. Sooner or later, generally the former, a patient under treatment with arsenic begins to cough, and expectorates a gelatinous mucus.

I believe this symptom, in the majority of cases, precedes neuritis and herpes. It is a warning signal. And whether arsenic is being used as a diagnostic aid in lymphadenoma, or for the treatment of any of the unravelled diseases, I am at present persuaded that the onset of respiratory catarrh is the time to stop the administration of arsenic. The good to be derived from it has by this time been obtained, and persistence in its use, without a pause, is to court danger.

I have found no special mention in textbooks of the effect of arsenic on the deeper parts of the respiratory tract—the bronchial tubes and possibly the alveoli—(I may not have read wide enough) and Dr. Parkes Weber has done a service in reading out to us a disregarded page of the book of clinical medicine.—I am, etc.,

S. M. HEBBLETHWAITE, M.D.Lond., M.R.C.P.

Cheltenham, Feb. 18th.

THE AFTER-EFFECTS OF GASTRO-ENTEROSTOMY.

SIR,—The report of the discussion on the after-effects of gastro-enterostomy, at the Surgical Section of the Royal Society of Medicine, in your issue of February 22nd, p. 392, and the paper by Mr. A. W. Bourne in that of March 1st, p. 438, give cause for serious inquiry into this subject.

These communications tend to shake the confidence of the average surgeon and the profession generally in the efficacy of the operation of gastro-enterostomy, and I do not think they should be allowed to pass without comment.

During the past fortnight I have communicated with all patients on whom gastro-enterostomy was performed during the year 1909 and during the past twelve months, with the exception of malignant cases and, of course, of those who died immediately after operation. Previous to 1909 I consider that my operative procedure in these cases was imperfect, hence I think it would serve no good purpose to go back further than that year, but the cases done in 1909 may reasonably enough be looked upon as providing "late" results, while those of the last twelve months provide "immediate" effects. Mr. Bourne's statistics must, of course, be judged from the same standpoint, but at the same time it does not appear from his paper that the technique pursued at St. Mary's Hospital has been altered since 1910. I communicated with 61 patients and received replies from 53. Six of the remaining 8 had, in the language of the Post Office, "gone and left no address." Of the 53 remaining, 50 declared themselves to be absolutely free from symptoms which had existed previous to operation, and, further, that none of the symptoms detailed by Dr. Hertz, who introduced the discussion at the Royal Society of Medicine, were present. Of the 3 cases who had complaints, the operation in 1 was done in 1909. This patient states that, while she is relieved of her stomach symptoms, she has a discharge from the bowel and a swelling in the left iliac region. She is known to be an alcoholic. So far as I can make out her symptoms are due to meso-sigmoid adhesions and accompanying colitis. Of the 2 cases in 1912, 1 complains of occasional "bilious attacks," but is otherwise well, and the other, who had possibly carcinomatous ulcer which could not be excised, states abruptly that he is not improved and suffers from "pain in the stomach, swelling, cough"!

This gives 5.7 per cent. which are not entirely relieved. Such after-results can surely be due only to the technique of the operative procedure adopted!

In a paper published in the *Lancet* (December 3rd, 1910, p. 1610) I drew attention to the principles on which I considered a proper operative procedure should be based, and the only modification of that procedure which I now adopt is the excision of every ulcer, when practicable. To recapitulate shortly, I consider that the following are the most important points to attend to: (*a*) The position; and (*b*) direction of the opening in the stomach (as near the pylorus as possible without causing angulation of the small intestine proximal or distal to the stoma); (*c*) the size of the opening (I make the opening in the stomach from the lesser to the greater curvature); and (*d*) the treatment of any extragastric abnormality which might possibly have a deleterious reflex action on gastric function. It will be seen that rapid drainage of the stomach is less aimed at than an attempt to make the post-operative conditions conform to normal function. As indicated in my paper referred to, even in so-called atonic stomachs the tone can be restored by appropriate after-treatment, while I find, further, that cases of normal acidity do as well as those with hyperacidity, and cases where no evidence of present or previous ulcer is found do as well as cases where such conditions are present.

I believe still what I have previously said, that the motor and secretory functions of the cardiac and pyloric parts of the stomach are distinct in action, there being a saccular cardiac portion and a tubular pyloric portion during digestion, which are more distinctly marked the more normal the stomach. The commencement of the pyloric tubular portion is indicated by what I have termed, for the sake of brevity, the "middle sphincter." One should appreciate, in the performance of gastro-enterostomy, the effects of the tonicity of the pyloric tube and place the stoma somewhere in it.

Dr. A. F. Hertz gives details of "certain unfavourable after-effects" in "many patients" subjected to gastro-enterostomy and afterwards investigated by him. Dr. Hertz (*Lancet*, December, 1910) criticized very adversely my interpretation of the motor and secretory functions of the stomach on which I base my operative procedures. The results I now publish appear to confirm strongly my interpretation, and should, I think, lead Dr. Hertz to modify the adverse views he then put forward.—I am, etc.,

Aberdeen, March 3rd. H. M. W. GRAY.

P.S.—Since writing the above, three more replies have arrived. All the patients express themselves as entirely relieved by the operation. This gives approximately 95.5 per cent. of my series who are entirely relieved.

IMMEDIATE OPERATION IN APPENDICITIS.

SIR,—I should not have ventured to communicate with you further in this matter had it not been that you mentioned some figures of mine in a leading article on February 22nd.

As a matter of fact, your quotation was not quite accurate, for I have operated on 173 cases of acute appendicitis with limited infection, with a mortality of 2.3 per cent. There are, however, other figures available which abundantly prove, at all events, the comparative safety of operating in the early stages of appendicitis, and if we take those published by my friend and colleague Mr. Richardson,[1] and my friend Mr. Burgess,[2] and add them to my own, we obtain a total of 464 cases with 6 deaths, or a mortality of only 1.3 per cent. Since his last communication to your journal, Mr. Burgess has operated on a further series of cases, and he tells me that he has now brought his mortality down for cases operated upon in this early stage to 0.55 per cent.

You state in your article that some of Sir George Beatson's patients were suffering from localized abscesses, whereas the figures that I have just quoted refer to cases in a much earlier stage. I have operated upon 184 cases of primary localized appendix abscess with 6 deaths, or a mortality of 3.26 per cent. If these are added to the series with limited but not localized infection we have 357 with 9 deaths, or a mortality of 2.5 per cent.

[1] BRITISH MEDICAL JOURNAL, September 28th, 1912.
[2] Ibid., February 24th, 1912.

The object of my present communication is to suggest that the time has arrived when we should find out the true mortality of *all* cases of appendicitis whatever the stage, and if those who countenance the delayed operation can then show a lesser mortality than those of us who believe in operating in practically every case we may have some grounds for altering our practice. The figures published as yet, with which I am familiar, are all in favour of the earliest possible operation.

Up to the end of last year I had operated on 681 cases of appendicitis of all varieties, with a mortality of 5.13 per cent., and during last year I operated in all on 118 cases with a mortality of 1.7 per cent.

I should feel that an apology were necessary for quoting all these figures were it not that the public, I am afraid sometimes guided by the profession, are only too ready to seize on any excuse for delaying operation, and we have found in this district that the views from time to time expressed in favour of a delayed operation have tended to do considerable harm. It is encouraging to note that the general tendency is in the opposite direction, for I find that cases come to hospital earlier and earlier each year and that the mortality from appendicitis is steadily diminishing—in my own series from 12.5 per cent. to 1.7 per cent.—and the figures of our infirmary show that the mortality has been exactly halved during the last ten years.—I am, etc.,

Newcastle-on-Tyne, Feb. 26th. G. GREY TURNER.

SIR,—I cordially agree with Mr. Edmund Owen's plea for immediate operation. To diagnose appendicitis is easy; to allocate the exact position of the appendix is generally possible, but neither skill nor experience infallibly indicate the subsiding appendix.

The difficulty lies in the fact that the same train of symptoms indicate a healing lesion or mask a gangrenous perforation; in many cases it is not possible to decide, even after a considerable experience, between these diverging alternatives.

The prognosis and the course of the disease is largely influenced by the anatomical position of the organ and the virulence of the organisms which attack it. If the appendix lies behind the caecum, the most devastating changes may go on without much outward and visible sign; but, in the case of an organ lying free among the intestines, the course is more rapid, the symptoms are more intense, and the need for treatment is more urgent.

The risk of operating on an acute appendix is very slight, but that of watching it is hardly so.—I am, etc.,

Birmingham, March 4th. E. MUSGRAVE WOODMAN.

OPERATIONS ON CHILDREN IN THE OUT-PATIENT DEPARTMENT.

SIR,—I was interested in Mr. Nicoll's paper and Mr. Andrew Fullerton's letter. I was for several years in charge of a large out-patient department of a dispensary. As we had no beds, only two courses were open to me: either to operate on the children myself, and send them home, or else send the case direct to the hospital. I chose the former, gradually increasing the scope of my operations from adenoids and tonsils, naevi, dermoid cysts, harelip, etc., to hydrocele, hernia, torticollis, tenotomy, etc. I operated on one boy 6 years old, who had a large psoas abscess, by emptying the abscess cavity and then filling it with bismuth emulsion; skiagraphs taken at intervals of twenty-four hours showed that the bismuth eventually reached the eleventh dorsal vertebra. This boy did very well, and in six weeks was running about. In this way the hospital was relieved of a large amount of work. The surgical out-patient department of every large hospital can be utilized as a nursery for young surgeons waiting to take their places on the senior staff.

The same applies to operations in private practice. Many cases can be undertaken at the surgeon's consulting rooms if he has a small theatre fitted up, and the patients then sent home to be under the care of their own medical man. I have found that many parents are willing and able to pay a reasonable fee for an operation; what they dread, because they are unable to afford it, is the cost of the nursing home, and many cases are sent to a hospital solely on this account.—I am, etc.,

Lincoln, March 4th. STANLEY GREEN.

THE NEGLECT OF VACCINATION.

SIR,—Will Dr. C. Killick Millard explain how "the future as regards small-pox prevention in this country lies with the medical officer of health rather than with the public vaccinator"? Do the Leicester authorities, in the event of small-pox, advocate or omit the vaccination of medical attendants and nurses, and contacts? If they omit it, how do they check the spread of infection? Will "sanitary reform in its widest sense," and "increased attention being paid to public health measures," diminish the susceptibility of the community to small-pox infection? The outbreaks of small-pox in the East End of London in 1911, and in Kirkcaldy last autumn, were due, one would think, not only to having "originated in mild unrecognized cases in vaccinated persons," but also to the victims being unprotected or imperfectly protected by vaccination; seed cannot grow without suitable soil. In Germany, with universal vaccination and revaccination, what few cases of small-pox occur are sometimes admitted to a medical ward of a general hospital without fear of other patients becoming infected; is there any hospital in England where this could be done?—I am, etc.,

Brent Knoll, Feb. 25th. J. W. PAPILLON, M.R.C.S.

SIR,—The annual meeting of the Association of Public Vaccinators has, as usual, temporarily directed attention to the vaccination question, but only temporarily; in a couple of weeks it will all have been forgotten, until the next annual meeting of the official vaccinators again directs an ephemeral interest towards it.

Sir James Crichton-Browne hit the nail on the head when he said: "It was difficult in these days for the still, small voice of scientific wisdom to make itself heard, but any turbulent and noisy coterie was allowed to influence the course of legislation." The reason is that the "noisy coterie" can influence votes and is organized for this purpose, whereas the "still, small voice of scientific wisdom" is crying in the wilderness, as far as votes are concerned; and we must remember that we now have what will probably be a series of Parliaments moved solely by votes and not by wisdom or reason. Sir James Crichton-Browne also said: "The number of conscientious objectors who proved to the satisfaction of one stipendiary magistrate, or two magistrates in petty sessions, that they believed that vaccination would be prejudicial to the health of their offspring was increasing largely." All this is perfectly true as regards the main conclusions, but inaccurate in a minor detail. Objectors have not to *prove* their objection "to the satisfaction" of the sitting magistrates. They have merely to assert it on oath, and the magistrates cannot then refuse the relief asked. Magistrates have to administer the law, not to make it; and even as regards interpretation of the law they are entirely in the hands of their official legal adviser, the clerk to the justices. Magistrates, most of them, hate signing these exemption certificates, and personally I never sign them if I can help it, passing on the duty—for duty it is—to non-medical colleagues whose qualms cannot be as urgent as mine.

Every one of these certificates of exemption is nothing but a licence for some poor defenceless little infant to have small-pox; if a girl, not improbably to the ruin of any good looks Nature may have intended her to have; and we, who ought to be the guardians and protectors of these innocent, helpless little ones against the dangers of ignorance, prejudice, and superstition—we are made the instruments for carrying into effect this legislation.

I have had over twenty years' experience as a county magistrate, and have also sat on a county borough bench as long as this has been in existence.

Surgeon-General Evatt made some very appropriate and vigorous remarks about "the public duty of applying a scientific preventive remedy to the population against a very dreadful disease of which he had seen so many terrible examples among unvaccinated people in India." He also said: "Medical men knew the truth about these things, and it was their duty to educate the people." Have we not been trying to educate the people with all our might for several generations? What is the result? There is less vaccination than ever, nearly 50 per cent. of the population being now unvaccinated. What have we as a profession got by our disinterested efforts? Nothing but abuse and offensive suggestions that it is vaccination fees we are after.

It is time we gave up this utopian dream of our "duty to educate the people." We get no thanks for our foolish philanthropic self-sacrifice. Let us do as other sections of the community are doing so effectively—look after ourselves. Leave the education of the people to the Government which takes our money for the purpose.—I am, etc.,

Blackpool, Feb. 20th. WM. HARDMAN.

SIR,—I hasten to express my sincere regret to Dr. Maude if my letter—in your issue of February 22nd—appeared to him at all offensive. I can assure him that my criticism was not intended to refer to him in any personal sense, but only in his capacity as representing the Association of Public Vaccinators.

Dr. Maude asks me if I am "aware of the elementary fact that small-pox is extremely fatal in infancy, and if I am aware of the dangers which an infantile population still runs." This is a part of the orthodox case in favour of compulsory vaccination which I feel bound, after my experience as medical officer of health for a largely unvaccinated population, to take exception to. I believe this particular provaccinist argument has lost much of its weight. I admit that the *fatality* of small-pox in infancy is high, and in bygone days, when small-pox cases were not isolated, and modern methods of small-pox prevention as now practised were virtually unknown, no doubt the *mortality* in infancy was also high, and unvaccinated infants ran a very serious risk. No doubt, too, in places where modern methods are not efficiently practised, the risk still exists. But I contend that since the introduction of modern methods the position is entirely changed, and in support of this I can adduce the experience of Leicester.

During the past twenty-five years 142,000 children have been born in Leicester, of whom, on an average, less than 10 per cent. have been vaccinated. Now, as to the small-pox figures, I will confine myself to the twelve years* that I have been medical officer of health. During this period I have had to deal with over 700 cases of small-pox. How many deaths does Dr. Maude imagine have been caused by the disease in infants under 12 months old? Only three! Strange, and contrary to expectation, but none the less true. Had Dr. Maude, or any other strongly provaccinist medical man, had a similar experience I venture to think that his views, like mine, might have undergone considerable modification as to the "danger which an (unvaccinated) infantile population still runs." Perhaps Dr. Maude may reply that we have been very fortunate in that, on the whole, the type of small-pox which has chiefly prevailed in Leicester has been very mild. Granted; but as the total number of infants under 12 months old who have been attacked was only 12, the mortality could not have been very high even if half the cases had proved fatal. It is the low attack-rate rather than the low fatality which is the really remarkable thing.

The explanation of this surprising immunity seems to me to be this: The danger of infection, under modern conditions of small-pox prevention, does not now lie so much in the home, where the infant chiefly resides, as in the crowded haunts of men, where the highly modified vaccinated case stalks undetected.

Or, take the period of childhood: The child population of Leicester is, of course, equally unprotected, yet never have I thought it necessary to close a public elementary school on account of small-pox.

Incidentally, I may remind Dr. Maude that, whilst the fatality of small-pox in infancy is above the average, during childhood—that is, after the first year or two—it is comparatively low. I am speaking, of course, of the unvaccinated. The fatality of small-pox in childhood in vaccinated subjects is, I am quite aware, practically *nil*.

Dr. Maude also says that it is "better to have a population which presents mild cases of small-pox . . . than severe ones." This sounds a truism, but I venture to suggest that, from the point of view of prevention, the conclusion is not so obvious as it appears. Moreover, the

*The small-pox figures for the twenty-five years 1888-1912 are: Total cases, 1,120; cases under 1 year of age, 20; deaths under 1 year, 5.

terms "mild" and "trifling" usually applied to the highly modified and abortive form of the disease which so frequently occurs in vaccinated subjects are most unfortunate and misleading. These cases are only "mild" and "trifling" so far as the particular individuals attacked are concerned; but from the vastly more important point of view of the community they are most dangerous, and frequently spread the disease to unprotected persons in its most virulent and fatal form. In this respect they present a marked contrast with the behaviour of small-pox in the natural and unmodified form usually seen in unvaccinated subjects. If severe, or moderately severe, the cases are then (with the one exception of the very rare haemorrhagic type) easily recognizable, so that the necessary steps for the prevention of the disease can at once be taken; or, if very mild, such as might escape detection (and such cases do occasionally occur even in the unvaccinated), then they are, in my experience, really mild and spread a mild type of the disease. To put it in another way, infantile vaccination only masks the disease without affecting the type. The virulence is there all the same; and under modern conditions I suggest it is conceivable that infantile vaccination is hindering our efforts at stamping out the disease quite as much as it is helping us.

Lastly, let me assure Dr. Maude that I give place to no one as regards my belief in and advocacy of vaccination used as it is used in Leicester—that is, when it is really needed. I think I may claim without boasting that I have made as many converts to vaccination as any medical man in Leicester. Certainly I think I have persuaded more antivaccinists to submit to vaccination. I know their side of the case well, and I can sympathize with it; but a photograph of my wife and young family (recently vaccinated) sitting in the Leicester Small-pox Hospital at the bedside of a bad confluent case of the disease is a powerful pictorial argument which has given me a great advantage.—I am, etc.,

C. KILLICK MILLARD, M.D., D.Sc.,
Medical Officer of Health.

Leicester, March 1st.

SHIP SURGEONS.

SIR,—As a former ship surgeon the letter on that subject (p. 472) was indeed welcome. Surely now is the time for the British Medical Association to take up the cause of the ship surgeon, for unless the subject is taken up by the whole profession it is useless for individuals to strive for higher pay.

The difficulty lies in the differences of ships and in the class of the passengers. For example, I was three months with one line which paid me £12 a month, yet I was far better off with another which only paid me £8, owing to the fact that now and then I got some good private fees from the passengers.

My chief object in this letter is to draw attention to the conditions under which ship surgeons have to work on emigrant ships. Last December I took a boat from Glasgow to Canada, and for the paltry pay of £8 a month I had to look after about 300 passengers. As the majority were travelling steerage I had to examine each one for vaccination marks and, if necessary, vaccinate them. As the weather was very bad almost everybody was either seasick or had a bad cold; the result was I was working almost all day. On the return trip scabies, pediculi pubis, etc., broke out among the passengers and crew, and so added to my work. Another objectionable part of my duties was visiting the firemen in their cabin when ill, or supposed to be ill. They all lived and ate in a small dirty unventilated cabin where the air was thick with tobacco smoke, and a heavy foul odour seemed to overcome me when I entered.

As I have only crossed the Atlantic once, other ships may not be so bad, but I am sure if all the members of our profession and the ship owners themselves knew the conditions under which medical men at sea have to work, they would soon raise the pay. Hoping that some former ship surgeons who now, perhaps, are high up in the profession will take the matter up, and let the true facts of the case be widely known.—I am, etc.,

ARTHUR D. CLANCHY.

Liverpool, March 2nd.

NATIONAL MEDICAL UNION.

SIR,—It has come to the knowledge of the Executive Committee of the National Medical Union that misleading statements as to the methods and objects of this association have appeared in many newspapers during the last few weeks throughout the country. These statements must have been founded on a mistake, the authors having confused the aim of two separate societies, the names of which are somewhat similar.

The National Medical Union has been in existence for nearly fifteen months, and is well known. The National Medical Guild is a new body which has been lately originated in London, and which is now making application for recognition as a trades union.

The National Medical Union as constituted at present is a society composed exclusively of medical men who do not intend to take service of any kind under the National Insurance Act as it now stands after April 14th, 1913. The Union exists primarily for the interests of these men. It has no intention of working on trades union lines. It aims at uniting "non-panel" men all over the country, at furthering their interests, and at defending their rights; it seeks to preserve the honour, independence, and efficiency of the profession, and it hopes to form a "rallying ground" for doctors who, having accepted service on panels and found out the impossibility of doing sound work thereon, are desirous of retiring therefrom.

The Union will work for the provision of adequate medical attendance for the industrial classes at reasonable remuneration on the lines of general practice, and it will seek for such amendment of the National Insurance Act as will secure this and safeguard the interests of both patients and doctor.

The National Medical Union, whilst sympathizing with the general attitude of the National Medical Guild, is not at the present time in favour of the promotion of their common aims by trades union methods.—We are, etc.,

G. A. WRIGHT, President.
WILLIAM COATES, Chairman.
J. WEBSTER WATTS, Secretary.
E. M. FLOYD,
J. SKARDON PROWSE, Honorary Secretaries.

Manchester, Feb. 27th.

Universities and Colleges.

UNIVERSITY OF CAMBRIDGE.

THE following degree has been conferred:

M.D.—W. R. Honeyburne.

UNIVERSITY OF SHEFFIELD.

THE Council at its last meeting appointed Miss Sophia M. V. Witts, M.D.Lond., to the newly instituted post of Lady Tutor in Anatomy.

UNIVERSITY OF GLASGOW.

Students' Council.

AT a special meeting of the Glasgow University Students' Representative Council called to consider the motions from the Inter-Universities Conference recently held at Aberdeen, the following among other resolutions were passed:

That the President of the Students' Representative Council attend Senate meetings when Students' Representative Council motions are under discussion.

That an inter-university committee, composed of members of the Senatus of the different Faculties of the four Scottish universities, be appointed to obtain information with regard to vacancies in Government and other services, and to publish a list of any such vacancies at the four universities for the benefit of students.

That this conference approves of the action of the Scottish universities in resisting the application of the inclusive fee in the Faculty of Medicine, and particularly desires that the extra-mural schools be not injured.

That there be three final professional examinations per annum in the Faculty of Medicine.

That the University Courts be urged to give a grant to the athletic club of each university, the sum, if necessary, to be obtained from an increase in the matriculation fee.

SOCIETY OF APOTHECARIES OF LONDON.

THE following candidates have been approved in the subjects indicated:

SURGERY.—*†W. H. Broughton, *†G. M. Cordingley, *†H. Cox, *†W. H. Edmunds, †A. M. L. Greaves, *E. M. Morris.

MEDICINE.—*†W. H. Edmunds, *T. H. W. Idris, †C. W. Jenner, *†A. Lowndes, †E. M. Morris, *S. Zarchi.
FORENSIC MEDICINE.—W. H. Edmunds, J. T. E. Evans, A. Lowndes.
MIDWIFERY.—J. T. E. Evans, H. C. C. Hackney, J. W. Harrison, A. Lowndes.

* Section I. † Section II.

The diploma of the Society has been granted to G. M. Cordingley, H. Cox, A. M. L. Greaves, J. W. Harrison, and C. W. Jenner.

Public Health AND POOR LAW MEDICAL SERVICES.

"POOR LAW DOCTORS' STRIKE."

UNDER this heading the *Burnley Express and Advertiser* publishes a report of a recent meeting of the Burnley Guardians. Some months ago all the district medical officers of the Burnley Union resigned their offices on account of the inadequacy of the remuneration, after repeatedly endeavouring to get redress from the guardians; and in so doing acted on the advice of the Burnley Division of the British Medical Association. The local profession has loyally supported the Poor Law medical officers, and the guardians, fearing there would be little chance of locally filling up their posts, have promoted various schemes of redistribution of the area of the respective districts, all more or less unsatisfactory in the opinion of the local profession. The following letter of protest to the Local Government Board from the Poor Law Medical Officers' Association of England and Wales, a copy of which was sent to the Burnley Guardians, shows pretty clearly the matter in dispute:

Right Hon. John Burns, M.P.

Sir,

I am directed by my Council to bring to the notice of your honourable Board the faulty arrangements for medical relief in the Burnley Union. For a long time past the district medical officers have been paid at a rate much below the average in adjoining unions, and after repeatedly petitioning the guardians for redress to no purpose, have, as a last resort, resigned their offices. The matter has attracted the notice of the Burnley Division of the British Medical Association, and that body has also approached the guardians on behalf of the medical officers of the union. The sympathy of the local profession is altogether with the medical officers, and it is likely the guardians will have considerable difficulty in filling up the vacant posts. In the meantime the guardians have decided to divide the union into twelve districts, paying £40 a year for the medical work in each, and making each medical officer public vaccinator in his own district.

My Council specially desire me to draw your attention to the following points:

1. Although by this arrangement the sum paid by the guardians for medical attendance on the sick poor of the union will be some increase as compared with the present scale of payment, it will still remain far behind the average of that paid in adjoining unions, where the same local conditions obtain as in Burnley.

2. The alteration in the vaccination districts is specially to be deplored. It has always been the policy of your honourable Board to encourage the formation of vaccination districts distinct from Poor Law districts, and to forbid the use of fees for public vaccination to eke out the payments of Poor Law medical officers. My Council is of opinion that the object of the Burnley Guardians in making each district medical officer a public vaccinator is to induce the applicants to undertake the Poor Law work at a lower salary than such work might fairly demand. They consider that such an arrangement does not tend to efficiency of public vaccination generally, and is detrimental to the welfare of the Poor Law medical service and the sick poor in their care.

I am, yours truly,
MAJOR GREENWOOD, Hon. Sec.

The comments of the guardians on this letter do not appear to have much cogency. They admit that they pay their medical officers less than adjoining unions, but are of opinion the latter should take a lesson from them, and similarly underpay their medical officers. They complain that no mention was made of some increases in the salaries of their medical officers last June. This only brings into prominence the terribly low rate of payment previous to last June. The suggestion that some of the resignations were brought about by professional pressure outside is an old story. Wherever united action is taken by the profession, those who consider themselves aggrieved invariably raise the cry of coercion. The figure £40 a year is also challenged as being incorrect, as also the proposal that the medical officer should be appointed public vaccinator. It is to be hoped that both these statements are incorrect, but they were taken from reports of meetings of the Burnley Guardians, published in the local press. A special committee has been appointed to consider the whole matter again, and it is to be hoped wiser counsels will prevail, and that the Burnley Guardians will come to an agreement with the local profession. In the meanwhile the profession at Burnley is to be congratulated on its united action, and we trust no practitioners from outside will be so wanting in professional spirit as to undersell their brethren at Burnley.

UNUSUAL ILLNESS AMONG WEAVERS OF COTTON CLOTH.*

MUCH interest attaches to the investigation of the causation of illnesses in industrial centres contracted by employed persons in the course of their employment and arising directly therefrom. In 1910, 1911, and 1912 an unusual illness was prevalent among weavers of cotton cloth at Colne and Burnley. The symptoms were constriction of the chest beneath the sternum followed by rapid breathing and a persistent irritating cough, expectoration of a thick yellow or yellowish green sputum, and a sweetish taste in the mouth. Later the symptoms assumed an asthma-like form, preventing sleep. Food might be rejected, and epistaxis was observed. There was general malaise, aching limbs and back, severe headache (usually frontal), and the temperature might rise to 102° in the evening. There was loss of weight, and in pronounced cases other symptoms were observed, such as herpetic eruptions, palpitation, smarting and running of the eyes.

In one instance at Burnley the weavers suffered so severely that the shed had eventually to be closed. Dr. Edgar L. Collis, H.M. Inspector of Factories, has issued a report on the subject, in which he traces the cause to mildew developing on the cotton threads following the process technically known as "taping" or "tape-sizing" with a preparation principally composed of flour (derived from wheat, sago, or potatoes), tallow, China clay, and water. In the class of manufacture on which the stricken weavers were engaged it appears antiseptics are omitted, as the dyers specify that no chlorides shall be present in the goods they buy. The practical result of Dr. Collis's observations is to confirm the advantage of the use of formaldehyde, which had already been suggested as an antiseptic where chlorides were forbidden.

The report is by no means conclusive. Visible moulds which are bluish-grey in colour are frequently observed on warp threads, and no such illness has been associated with their presence. Dr. Collis mentions that no "visible" signs of mildew were present in the warps at Colne and Burnley. He suggests that "possibly some unusual mildew, of which the growth is similar in colour to the cotton threads, was present on these warps and was the cause of the illness." Such growth could have been demonstrated by microscopic examination if it had been possible for the suspected material to be examined in this way. No such examination is mentioned in the report. Various forms of mildew were found (in the flour used) by the experts called in. Dr. Collis suggests that one of these moulds may have been pathogenic and caused the symptoms, although Dr. Markham at Burnley failed to find any unusual mildew present in the sputum examined. The unusual illness described is fortunately of rare occurrence. As the occupation is exceedingly common, obviously the cause is some obscure variation the exact nature of which is still in doubt.

POOR LAW MEDICAL OFFICERS' ASSOCIATION OF ENGLAND AND WALES.

A COUNCIL meeting of this association was held at 34, Copthall Avenue, E.C., on February 13th, when Dr. D. B. Balding, J.P., was in the chair.

What Constitutes a Legal Order?

A communication was read from a country member asking what constituted a legal order. He had received from his relieving officer a portion of a postcard on which was written a name and an address, with the word "lunatic" inscribed below and the initials of the officer. He visited this case, and payment was offered him. Could he properly have accepted it? The honorary secretary had written that if the case had been referred to him by his relieving officer, any attendance on it must be reckoned as forming part of his official duties, and no payment could be taken. This was approved by the Council, and the unanimous opinion was that a Poor Law medical officer

* Reports of Unusual Illness among Weavers of Cotton Cloth. By Edgar L. Collis, H.M. Medical Inspector of Factories. Printed for His Majesty's Stationery Office by Darling and Son, Ltd., Bacon Street, London, E. 1913.

could not be too careful in guarding himself against the charge of accepting payment for attendance on any cases that came within the scope of his official duties.

Refraction.

The question whether the testing of errors of refraction with a view to ordering glasses formed part of the duties of a Poor Law medical officer, referred to the Council by the Medical Defence Union, was discussed. The unanimous opinion was expressed that such a duty had never hitherto been imposed, and that, generally speaking, Poor Law medical officers were not competent to undertake such work. The necessary apparatus was not possessed by one Poor Law medical officer in a hundred, and even if it were supplied, as it would have to be, by the guardians, until the officer had gained experience in its use the results were likely to be far from satisfactory. In the case of dentistry, the General Orders specially laid down that the duties of a Poor Law medical officer went no further than the extraction of teeth. It was unreasonable to think, therefore, that duties such as in ordinary medical practice were universally referred to a specialist should be expected from a Poor Law medical officer. In the interests of the elementary school children of the country it was necessary to oppose such an imposition. School medical officers who were required to deal with this subject had always to produce credentials of competence in this branch of medicine. If the association admitted that work regarded universally as properly belonging to the province of a specialist should be held to be one of the ordinary duties of a medical practitioner, the interests of a large portion of the medical profession might be seriously affected. The Regulations under the National Insurance Act defined what work was to be considered to come within the scope of an ordinary practitioner. They were by no means clearly set out, but if it were admitted that dealing with errors of refraction formed part of the duties of Poor Law medical officers, it would be difficult to exclude them in the case of practitioners on the panel. The Honorary Secretary was instructed to take the earliest opportunity of bringing this matter before the Local Government Board and pressing upon it the views of the association.

Officers of Boards of Guardians.

A letter was read from the Manchester and District Assistant Clerks' Association, asking for support to a petition it was proposed to send to the Local Government Board praying that sanction should not be given to the appointment of inexperienced persons to the respective offices of clerk and first assistant clerk to boards of guardians. The petition was approved by the Council and the Honorary Secretary instructed to state that the Poor Law Medical Officers' Association would give any assistance in their power.

Resignations of Medical Officers at Burnley.

The Honorary Secretary reported that he had written, as instructed, to the Local Government Board, pointing out the way in which medical relief was being administered in the Burnley Union; that the Burnley Guardians, to whom the letter had been sent for comment, had contented themselves with questioning the accuracy of some of the statements in the letter, and had made no reply to the more important criticism therein. With regard to the inaccuracies, if any, they were culled from the reports of meetings of the Burnley Guardians published in the local press, copies of which had been sent with the letter to the Local Government Board. In the meanwhile a special form of order was in use in the Burnley Union, which might be taken to any practitioner, but, as a matter of fact, by agreement among the local profession, was referred to the late district medical officers. For attendance under this order the guardians guaranteed payment at the usual private rates current in the district. Such an arrangement would be far more expensive than the old, and the ratepayers suffered, because the guardians refused to treat their medical officers with equity. Up to the present no sanction had been given by the Local Government Board to any scheme of the Burnley Guardians, and the local profession were loyally assisting their Poor Law brethren. The Council did not think it desirable to take any further action until an answer to their letter had been received from the Local Government Board.

Annual Meeting.

It was decided that the date of the annual meeting, which is to be held in London, should be either during the last week of June or at the beginning of July. It was thought advisable that there should be two papers read dealing with Poor Law subjects, one from a Poor Law medical officer, and the other, if possible, from a non-medical Poor Law official. It was also resolved that the usual dinner should be held in the evening.

Insurance Act.

It was pointed out that many cases were being referred by panel doctors to relieving officers with a view to their admission into Poor Law infirmaries. Where institutional treatment was necessary there was no objection, but some of the cases could not be placed in that category, and if medical attendance were given by the Poor Law, it would have to be by the district medical officer at the patient's home.

The Council was unanimously of opinion that in no circumstance should an insured person entitled to the service of a panel doctor be treated by a Poor Law medical officer except in the wards of a Poor Law institution. It might happen that under the Poor Law Orders a district medical officer was compelled to visit an insured person in receipt of Poor Law relief, to give the necessary certificate; but the treatment of these cases should be left entirely in the hands of the panel doctor.

With regard to the maternity benefit, it was pointed out that the dependants of insured persons not infrequently went into the infirmary to be confined. The guardians could make no claim on this benefit, which was received by the husband with no deduction. It was to his interest, therefore, that his wife should be attended in the infirmary, but the main object of the benefit in question was to meet expenses incident to the confinement. It was possible for the guardians to make demand on the husband for a contribution towards the cost of his wife's attendance in the infirmary; but this was seldom done, and the husband's position apart from the maternity benefit might not warrant any demand being made.

The Council was of opinion that the framers of the Act had hardly contemplated the employment of maternity benefit in this manner; nor was it fair that provision should be made out of the rates in respect of services for which Parliament had already made a grant. Overlapping was the curse of the Poor Law, and it seemed not unlikely that one of the effects of the Insurance Act would be considerably to increase this evil.

Obituary.

SIR COLVIN COLVIN-SMITH, K.C.B.,

SURGEON-GENERAL, INDIAN MEDICAL SERVICE.

SURGEON-GENERAL SIR COLVIN COLVIN-SMITH, K.C.B., Madras Medical Service, retired, died at his residence, 5, Cresswell Gardens, South Kensington, on March 1st, 1913. He was the son of the late Rev. Robert Smith, D.D., of Aberdeen, and was born on August 4th, 1829, and educated at King's College, Aberdeen, where he took the M.D. in 1851, as well as the L.R.C.S. at Edinburgh in 1850. He entered the Indian Medical Service as Surgeon on November 3rd, 1851; became Surgeon on December 14th, 1864; Surgeon-Major on November 3rd, 1871; and Deputy Surgeon-General on August 5th, 1879, retiring with an honorary step of rank on September 29th, 1884.

He had a long list of war service, beginning immediately after his arrival in India with the second Burmese war of 1852–53, when he served in the operations before Rangoon in April, 1852, at the capture of the White House stockade and of the Shwe Dagon pagoda, and the occupation of Prome, and received the medal with a clasp. In the Indian Mutiny he was in the field for two years, 1857–59, serving with the Kampti movable column and with the Sagar Field Division; he was present in the affairs at Khoni Pass, Narampur, Nimkaira, Budgam, and other minor skirmishes on the Great Dekkan road; also in operations in the Palamau district, and in the march to Jabalpur. He received the Mutiny medal with a clasp. In 1881 he was appointed Deputy Surgeon-General of the Haidarabad Subsidiary Force and Haidarabad Contingent, and while holding that post was chosen as Principal Medical Officer of the force dispatched from India to the Egyptian war of 1882. There he took part in the battle of Tel-el-Kebir, and in the forced march to and occupation of Zagazig, was mentioned in dispatches in the *London Gazette* of November 17th, 1882, and received the Egyptian medal with a clasp, the Khedive's bronze star, the third class of the Osmanieh, and the C.B. After retirement, he was appointed an Honorary Surgeon to the Queen on July 5th, 1899, thus holding that honour in three reigns; received a Good Service Pension on January 18th, 1903, and was promoted to K.C.B. on June 26th, 1903.

In 1864 he married Marian, daughter of the Rev. Henry Phillips, of Great Welnetham, but lost his wife in 1908. A memorial service was held at St. Columba's Church, Pont Street, on March 4th; the interment took place at Kingston cemetery on the same day.

WE regret to have to announce the death of Dr. ALFRED AUGUSTUS BEEKS, of New Silksworth, Sunderland, which took place at the Fever Hospital, Sunderland, as a consequence of an attack of scarlet fever. He was taken ill on February 14th, and was removed on February 17th to the hospital, where he died on February 21st. His sudden illness and death has been a great shock to his many friends. It is to be feared that the hard harassing work in connexion with the conditions imposed by the Insurance Act greatly debilitated his system, and he doubtless contracted his fatal illness while attending his duties in this

depressed state of health, which had been further lowered by a severe cold. He was educated at Dollar Academy, and was a student at the School of the Royal College of Surgeons of Edinburgh. He obtained the diplomas of L.R.C.P. and L.R.C.S.Edin., and L.F.P.S.Glas., in 1901. In February, 1902, he became assistant to Dr. Bernard, of Silksworth, and shortly afterwards joined him in partnership. Dr. Beeks joined the Territorial Force and attained the rank of Captain, R.A.M.C.(T.F.). He was attached to the Northumbrian (County of Durham) Brigade, and in this capacity and as honorary surgeon to the St. John Ambulance Brigade he won the respect and friendship of all with whom he served. He was a member of the British Medical Association and took a keen interest in its work. He was buried with military honours, and the funeral was very largely attended by residents in Silksworth and by representatives of the profession in the district.

The Services.

MEDICAL BENEFIT FOR CIVILIAN SUBORDINATES.

INSTRUCTIONS relative to the administration of medical benefit to civilian subordinates (including pensioners) who are insured under the Insurance Act are published in Scottish Command orders: All insured civilian subordinates are entitled to receive medical benefit under the Act. Medical attendance will therefore no longer be given to insured pensioners who do not reside within the precincts of barracks (including schools, colleges, hospitals, magazines, Government quarters, etc.). They will be attended by the panel doctors. In the case of insured civilian subordinates living in barracks, etc., for whom medical treatment has hitherto been provided by medical officers of the War Department (military medical officers or civil medical practitioners under agreement), it is desirable, both on grounds of general convenience and in the interests of discipline, and with a view to the avoidance of all possible sources of friction, that the present practice should be continued, medical attendance, drugs, etc., being provided from army funds in return for capitation fees to be paid by the Local Insurance Committees and credited to Army Appropriations in Aid.

TERRITORIAL NURSING SERVICE.

THE annual meeting of the 1st Southern General Hospital Territorial Nursing Service was held in the Council House, Birmingham, on February 24th, Lady Fairfax Lucy presiding. The principal matron of the hospital, Miss M. A. Buckingham, reported that the nursing staff consisted of 10 matrons of hospitals, 11 district nurses, 46 hospital ward sisters, 48 private nurses, and 5 trained nurses of no occupation at present, a total strength of 120. Miss F. Clarke, one of the matrons of the hospital, took a course of training in August last at Shorncliffe Military Hospital, at the same time as the R.A.M.C.(T.) of the 1st Southern General Hospital were doing their annual training.

NEW HEAD QUARTERS OF THE FIRST LONDON DIVISION R.A.M.C.(T.F.).

THE new head quarters of the First London Division (Territorial Force) Royal Army Medical Corps, in the Duke of York's School, Chelsea, were opened by Major-General W. Fry, C.B., C.V.O., commanding the First London Division (Territorial Force), on March 1st. Major-General Fry said that some people had objected that so many units should be brought together in the Duke of York's School, but he did not share those fears, and had always found the medical corps very popular. One reason was that in the medical unit there was a close bond between the officer and the man. Where the officer was the instructor of the man the discipline was miles ahead of that of corps in which the actual technical instructors were the only people to teach the rank and file.

As was mentioned last week, the Committee of Management of the Mount Vernon Hospital for Consumption and Diseases of the Chest at Hampstead and Northwood will ask the governors at the annual meeting on Wednesday next to sanction the sale of the hospital at Hampstead. At this meeting the Chairman of the Medical Board (Dr. F. W. Tunnicliffe) will move the following amendment: "Considering that the entire medical and surgical staff has expressed the considered opinion that on medical grounds it is not practicable to conduct a chest hospital in the true sense of the term at Northwood, this meeting directs that the further consideration of the Chairman's resolution be deferred until March, 1914, and that the Committee of Management be called upon to exercise, if necessary, the powers conferred upon them at the last meeting of governors to separate the two institutions, with a view to a further and better perpetuation of the hospitals at Hampstead and Northwood."

Medical News.

THE annual general meeting of the Medical Graduates' College and Polyclinic will be held at 22, Chenies Street, W.C., on March 14th, when Sir William J. Collins will take the chair at 5.15 p.m.

THE late Dr. William Howship Dickinson bequeathed £1,000 in memory of his son to the Samaritan Fund of St. George's Hospital, to be known as the Lee-Dickinson Memorial Fund. The total estate was £39,790 gross.

THE Arris and Gale Lectures before the Royal College of Surgeons of England by Dr. Blair Bell, on the genital functions of the ductless glands, will be given on Monday and Wednesday next, at 5 p.m. on each day. The lectures will be illustrated by lantern slides.

DR. S. N. GALBRAITH, D.P.H., acting resident medical officer at Brompton Hospital, has been appointed assistant tuberculosis officer under the Lambeth Borough Council, at a commencing salary of £300 a year. There were fifteen applications for the appointment.

SIR FREDERIC EVE commenced a course of two lectures on malignant tumours of the long bones, their pathology, symptoms, and treatment, at the London Hospital on Tuesday last. The second lecture will be given next Tuesday at 1 p.m. The attendance of members of the profession and students is invited.

THE International Congress of Physical Education, which has been organized by the Faculty of Medicine of Paris, with Professor Gilbert as President, is placed under the patronage of no less than three Presidents of the French Republic—M. Fallières, M. Loubet, and M. Poincaré. It is to be held in Paris from March 17th to 20th. As many as twenty-five nations are sending representatives to take part in this congress, at which the methods of physical education now in vogue in different countries will be discussed and criticized, in the hope that the free interchange of opinions and experiences will make it possible to place the present system of physical culture on a more rational and scientific basis. There will be two sections. The first section will comprise discussions on the whole range of athletics, from military gymnastics to feminine sports; whilst the second will consist of a series of demonstrations by expert gymnasts from almost every country in Europe. An interesting exhibition of physical education and sports has been organized by Dr. Albert Weill in connexion with the congress, and is to be on view from March 17th to 26th. Reduced fares have been granted by the French railway companies to all members travelling to Paris, and a fee of 20 francs (in the case of members' relatives, 10 francs) will admit each member to the various fêtes and demonstrations, besides entitling him to all publications issued by the congress. Subscriptions and inquiries should be addressed to the Secretary, Dr. Henri Dausset, 41, Avenue Montaigne, or to the Treasurer, Dr. Lagarde, 9, rue de Bassano, Paris.

LAST year the King conferred on the British Medical Benevolent Fund the title of Royal, and to celebrate the first year of the Royal Medical Benevolent Fund a dinner of those interested in the fund and its guild, both ladies and gentlemen, will be held under the chairmanship of H.R.H. Prince Arthur of Connaught on Wednesday, April 30th, at the Hotel Cecil, London. A large number of members of the profession have already consented to act as stewards, among whom are Sir Clifford Allbutt, K.C.B., Mr. Gilbert Barling, Sir Thomas Barlow, Adeline, Duchess of Bedford, Sir J. Rose Bradford, the Dowager Lady Broadbent, Lady Willoughby de Broke, Dr. H. Langley Browne, Dr. J. Mitchell Bruce, Sir Lauder Brunton, Dr. C. Buttar, Dr. Wm. Collier, Sir Anderson Critchett, Sir Dyce Duckworth, Mr. J. Swinford Edwards, Mr. E. Hurry Fenwick, Sir David Ferrier, Sir J. Kingston Fowler, Sir Alfred Fripp, Sir Rickman Godlee, Sir James Goodhart, Sir Alfred Pearce Gould, Dr. Walter Griffith, Dr. de Havilland Hall, Mr. Arbuthnot Lane, Sir Trevor Lawrence, Mr. C. B. Lockwood, Sir Donald MacAlister, K.C.B., Mr. G. H. Makins, Professor Howard Marsh, Mr. J. H. Morgan, Sir Malcolm Morris, Dr. F. Needham, Lady Northcote, Dr. J. A. Ormerod, Sir Wm. Osler, Mr. Herbert Page, Sir R. Douglas Powell, Sir James Reid, Dr. H. D. Rolleston, Sir Ronald Ross, Sir George Savage, Mrs. Scharlieb, Lady Shaftesbury, Sir R. M. Simon, Mr. H. J. Stiles, Mr. Charters Symonds, Sir StClair Thomson, Dr. W. Thorburn, Dr. Nestor Tirard, Dr. D. F. Todd, Sir William Turner, Sir John Tweedy, Dr. J. C. Uhthoff, Katherine, Duchess of Westminster, Dr. Hale White, Sir John Williams, Dr. I. Burney Yeo, and Mr. Parker Young. Communications relating to the dinner may be addressed to Mr. G. Bethell, 11, Chandos Street, Cavendish Square, W.

and subscriptions sent to the Treasurer, Dr. Samuel West, 15, Wimpole Street, London, W.

THE third of the series of Galton laboratory lectures on "National Eugenics," delivered by Miss Ethel Elderton at University College, London, dealt with the relation of fertility in man to "social value" in the parent, the term being used to designate fitness of one human being to become the parent of another. Her own observations amongst the working classes in the North tended to prove that the greater the social value the less the fertility; and the truth of this statement was confirmed by statistics dealing with the decline in the birth-rate amongst the population north of the Humber between the years 1851 and 1906. This fall, which had taken place throughout the whole of the North, was most marked in the residential and industrial districts, particularly those engaged in the textile industries. Miss Elderton contended that though the Malthusian school had shown that limitation of the family was possible, their views would not have spread unless the wish to have children had diminished owing to some social or economic factor. It had been suggested that the restriction of child labour, possibly combined since 1891 with the restrictions on the mother's labour after childbirth, had caused the fall in the birth-rate in the textile districts. Unfortunately it was the thrifty, hard-working section of the community who limited their families, and this could not fail to have a disastrous effect upon future generations. In considering suggestions that the half-time system should be abolished, that the age of school attendance should be raised to 16, and that the mother's work should be curtailed, it should be borne in mind that many parents would find it impossible to keep their children during these additional years, and some of them, in consequence, would be obliged to restrict their families still further. Such a change would have little effect upon the thriftless and careless; but it might make a considerable difference to the intelligent and careful, unless it could be accompanied by some endowment of healthy, thrifty, and intelligent parents. Legislation on these points would have to proceed with caution, for in striving to better the condition of the individual it might only be adding another burden to the class whose children were one of the most valuable assets of the State.

A MEETING in support of the Women's Guild of the Royal Medical Benevolent Fund was held on February 25th at 49, Upper Brook Street, by permission of Mr. and Mrs. Makins. Dr. Acland, who presided, said that the object of the Guild was not only to seek out cases of distress amongst the families of medical men and report them to the Fund, but to see that they obtained the relief they deserved. A short account of the foundation of the Guild was then given by Mrs. Scharlieb, who reminded her audience that it had begun in a very small way, but, thanks to the energy of Lady Tweedy, had since been able to establish branches in most of the large towns in the kingdom. These provincial branches had soon outstripped London; and the latter, in consequence, had been divided into districts, which at the present moment were in a very flourishing condition. The Guild had a special fund for the orphan children of doctors. The children were sent to good schools and afterwards were put in the way of earning their own living, and these were the cases that constituted the best investments of the Guild. The whole of England had been thrilled by the heroism of Captain Scott and his companions, but it should not be forgotten that there were other heroes in our midst who faced death daily just as bravely as those who died amidst the Antarctic snows, and oftentimes with the knowledge that they were leaving those dependent on them totally unprovided for. Sir Ronald Ross, in commending the work of the Guild, said he could imagine no more terrible plight than that of a widow left with a young and helpless family, and unfortunately this was too often the case when a doctor died suddenly. He instanced the case of one of the greatest medical heroes of modern times—Dr. Walter Reed—who, with his helpers, found out how yellow fever, the pest of Central America, was carried. Shortly after making this important discovery, Reed broke down and died, leaving a widow and some little children. It was only with the greatest difficulty that the scientific and medical men of America were able to persuade the Government of that rich country to give a pension to the widow of the man who had conferred so great a benefit upon humanity. He was quite certain that there were many cases of a similar nature in this country; they had the strongest possible claim upon the help and sympathy of the whole profession. A short speech by Dr. Ettie Sayer followed, and the meeting closed with a vote of thanks to Mr. and Mrs. Makins.

Letters, Notes, and Answers.

Queries, answers, and communications relating to subjects to which special departments of the BRITISH MEDICAL JOURNAL *are devoted will be found under their respective headings.*

QUERIES.

HAMPSHIRE PHYSICIAN will be glad to hear of a desirable holiday resort in the North of France; country preferred, or small town or suburb.

ALOPECIA UNIVERSALIS.

J. A. R. asks for advice in the treatment of a middle-aged man who, four months after a severe mental and physical strain, began to lose his hair; after a few weeks not a hair was left on his body. Treatment with nerve tonics has been tried without success.

WHEN WAS POTASSIUM IODIDE FIRST USED?

DR. J. F. KEENAN (Ballinalee, Edgeworthstown) writes: In the Literary Notes in the JOURNAL of February 15th, p. 353, it is said that "to Dr. Wallace of Dublin belongs the honour of first using potassium iodide in syphilis." In the JOURNAL of January 26th, 1907, Dr. J. McNamara wrote that "the introduction of iodide of potassium in the treatment of tertiary syphilis . . . was due to a humble Irish practitioner named Welch." What was the true form of the name of our humble Irish predecessor, who conferred such a boon on Britain and civilization? Dr. McNamara went on to say that "the name of Dr. Welch, instead of being forgotten, as it is, should stand high on the roll of fame." Alas! it seems that we do not even know how to spell it. Was Welch Wallace, or Wallace Welch, or both of them Walshe?

ANSWERS.

W. C. S.—We have no knowledge of an "International Congress on Nose and Throat to be held in London next August." In connexion with the Seventeenth International Congress of Medicine, to be held in London on August 6th to 12th of this year, Section XV will be devoted to rhinology and laryngology. Possibly our correspondent refers to this. If so, the better way would be for him to communicate with the General Secretary, at the Central Office, 13, Hinde Street, London, W.

TESTS FOR DEATH.

L. A. P.—(1) Icard's test for death is performed by injecting under the skin a solution of fluorescin and sodium bicarbonate. Life is proved by the rapid development of a greenish-yellow discoloration of the general surface of the body and mucous membranes (Hawthorne, *For. Med.*, p. 42). We are unable to express any opinion as to its reliability, but there seems no inherent improbability; whether it could ever be of use is another matter. (2) We have no information as to Icard's lead acetate test.

LETTERS, NOTES, ETC.

THE LATIN FOR "BEER."

DR. R. CARMICHAEL WORSLEY (Coventry) sends us the following, which he seems to wish us to believe a true story. New Casualty Dresser (referring to entry in register): "Porter, what does this entry mean—C_2H_6O?" Porter (with superior smile): "That, sir, is the Latin for beer, sir."

A DISCLAIMER.

WE have received the following:

Sir,

We regret that our names have appeared in an article on the treatment of consumption which was published in the *Daily Telegraph* on the 1st inst., and wish to state that the article in question was written and published without our knowledge and consent.

Yours truly,

J. CAMPBELL MCCLURE.
F. MEHNARTO.
J. HORNE WILSON.
KENNETH ECKENSTEIN.
R. TANNER HEWLETT.

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